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Kromayer Lamp Treating Lesion on Face (Frontispiece)

ULTRA VIOLET RAYS IN MODERN DERMATOLOGY

INCLUDING THE EVOLUTION OF ARTIFICIAL LIGHT RAYS AND **THERAPEUTIC TECHNIQUE**

BY

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AUTHOR OF

"ELEMENTARY DERMATOLOGY"—NUMEROUS BROCHURES ON SKIN DISEASES, ETC.

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PREFACE

THE efficacy of ultra violet rays in the practice of dermatology is now thoroughly established, and its bactericidal action, its anti-pruritic and analgesic effects, as well as its reconstructive action upon epidermal cells and its constitutional effect upon the general economy, cannot now be denied.

The author has been prompted to write this book because no American author has heretofore attempted it, the profession relying entirely upon the writings of their European colleagues.

It is the author's intention to present the subject as briefly as possible with clearness, and with no intention of going into histo-pathologic details. The mere thought in mind will be to give in a practical way to the profession the results of his clinical experience with the use of ultra violet radiations in the treatment of the various skin diseases for which he has found the ultra violet light a desirable agent.

The presentation of long lists of case histories becomes more or less tiresome, and the knowledge to be gained thereby is not as valuable as

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the summarizing of one's experience under the heading of the disease treated.

The author will, therefore, give his experience in just that way, having had experience in the treatment of many cutaneous diseases, giving the rays full credit where they have been particularly efficacious, and as well reciting his deductions where the radiations have not been as successful as one might desire.

The author has no intention of being over-enthusiastic in his deductions as to the value of ultra violet rays in the practice of dermatology, but will give his unbiased and candid opinions just as he has been able to deduce them from his own personal experience.

The cases treated by the author are mostly from those of private practice, the Skin Section of the Department of Medicine of the Hahnemann Medical College and Hospital of Philadelphia, and various other institutions with which the author is connected.

The author has thoroughly gleaned the literature of the day and hereby gives credit for the material which he has used therefrom to the foreign writings of Morris, Dore, Bach, Wagner, Kruger, and Blaschko, and to the following writers from our own continent: Martin, MacKee, Jordan, Plank, Collins, and Allen.

The clinical deductions made by the author under "Therapeutic Technique" are entirely his own, and are in no way biased by the results and opinions of others.

The author is indebted to the Hanovia Chemical and Manufacturing Company, of Newark, New Jersey, for the liberal use of plates and other material; to the publishers for their promptness and uniform courtesy, and as well to the amanuensis, Mr. T. F. Arnold, for having arranged the index, re-read the proof sheets, and for having compiled various data. The author as well extends his thanks and appreciation to Mr. I. J. Allen and Mr. L. J. McManus for their many helpful suggestions and their constant readiness to want to be of assistance in solving various technical problems.

RALPH BERNSTEIN, M. D.

No. 37 S. 19th St.,
Phila., Pa., October 1st, 1918.

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PART I.

THE EVOLUTION OF ARTIFICIAL LIGHT RAYS.

Some patients are naturally inquisitive and eager for knowledge, and it is the wise physician who will have at his finger ends the information to reply to the questions which his patients are so apt to ask him. It not only at once stamps him as a well-read and educated practitioner, but at the same time makes the necessary psychological impression upon his patient, which is so necessary in these modern times.

The author, in presenting the historical data on light therapy in the treatment of skin diseases, gleaned it entirely from the writings of others, and has given them credit as already mentioned in the preface.

It is a well known fact that the Egyptians treated their patients by exposure to the sun. As early as the first century and then not until the tenth the sun's rays were made use of in the treatment of certain diseases, both systemic and local, and was just as frequently entirely discarded.

Certain it is that light was used from time to time for therapeutic purposes by the ancients and was greatly appreciated, particularly by the Romans, who were well aware of the beneficial effects of what was known as the "sun bath."

There is no doubt that they did not have the true conception as to the benefits received from such treatment, believing that the results were obtained from the warmth of the sun's rays rather than from the chemical effect upon the system.

To Finsen belongs the credit for having utilized light in the proper manner for its therapeutic effects. Practically all that was written before the time of Finsen belonged to the metaphysical realms. The knowledge as to the effects of sunlight before the time of Finsen was simply one of general stimulative effect upon the whole organism, it being taken for granted that the entire effect was beneficial.

Finsen based his deductions upon an entirely different hypothesis, and, that is, upon the destructive action of sunlight upon the human being. His first observations were not of a helpful character because he inadvertently advised the non-use of the chemical rays of the sun in patients suffering from smallpox. These rays he called the "harmful" rays.

His object was to have the patient in a room in which only the red rays of light were allowed to penetrate, which rays were known to have only the slightest chemical action. This was brought about by having the rays from the sun pass through red colored glass which caused all of the rays from the sun to be absorbed but the red rays.

While the therapeutic application of the rays of the sun to the body in general was practiced by those of ancient times without their action being understood, we are in a position to-day to understand more or less their exact worth and method of action. We cannot now question but that there is a decided curative action and even prophylaxis in solarization of the nude body.

We believe in this modern age of ours that life belongs to light in its chemical action on one side and death to darkness on the other side. Frequently the wonderful improvements in patients suffering with psoriasis is to be seen after exposure of their bodies to the sunlight for protracted periods of time at the seashore.

Light is important to longevity, and without it life in the human or animal species cannot exist, and certain it is that the chemical rays are absolutely necessary for existence.

It is also a well known fact that certain rays of the sun are deleterious to the human economy, and science has as well demonstrated that there are certain rays emanating from the sun which are a decidedly beneficial and curative agent to diseased states. Science has also demonstrated that it is the ultra violet rays which are responsible.

The Greeks and Romans in early times, in order to maintain bodily health, exposed their naked bodies to the sun. Cicero, as well as the younger Pliny, spoke of "sunning places" upon the roofs and in the gardens, and there were as well solariums in the dwellings. Little did they know that it was the ultra violet rays which were responsible for the therapeutic effects.

Herodatus, in his early day, recognized the stimulating qualities and power of light therapy, both as a prophylaxis against disease, and in bringing about recuperation after ill health.

Antyllus was of the idea that it would annihilate dropsy, and commented upon it in the treatment of hysteria, hypochondriasis and certain other nervous affections; Aurelinus advised the sun's rays in certain pathological states, including arthritis, cachexia and obesity.

The Romans at that time had no conception of

the action of light rays. It was not even known in those days that the sun was the source of light. It was observed by Herodatus that unless the bowels were profusely moved the solar rays might have a deleterious effect upon the head.

Really one of the first evidences of recent times of an attempt to revive the therapy of light after centuries of relegation to the past was the University of Gottigen which, in 1796, offered a prize for the most able essay on the effect of light upon the human body, both innocuous and salutary.

As time went on it was demonstrated that sunlight had an inhibitory effect upon the life of certain bacteria. The chemical action, however, at that time was not understood. Even in those days pulmonary diseases, tuberculosis of the bones and joints and of the skin were improved.

In the early days it was particularly noted that sun baths were of especial value in defects of metabolism, and it was even then noted that the sun's rays were beneficial in certain types of diseases of the skin. It was also mentioned that they exerted a beneficial influence in psoriasis, in eczema and in acne, and that holds good even to-day, particularly in locations which are high and the ultra violet rays are not interfered with

in penetrating to the earth's surface by the various gaseous strata which surround the earth.

The old-time country practitioner still uses the magnifying glass which he concentrates upon localized diseased states for its therapeutic effects and with good results and upon which he swears.

The solarium as has been used in the past by the ancients is even still used to-day. The patient in the nude state sports about either in the open or in glass enclosures or on roof tops.

To-day, as in the days of the past, exposures to the sun's rays were measured by the strength and powers of resistance of the patient. The sensitiveness of the patient's skin as to whether they were light or dark complexioned.

In days gone by they varied the times of exposure from half an hour to an hour for those who were delicate, and to several hours for those more robust and dark complexioned.

They also varied the exposures according to the altitude—the higher the altitude the less the exposure; and in our modern knowledge of the subject it is well known that the higher the altitude and the rarer the atmosphere the more powerful are the actinic or ultra violet rays which, after all, are the real curative or therapeutic rays which are given forth by the sun.

Even in days gone by physicians directed their patients to accept the seashore as an ideal place to obtain full benefit from the sun bath, because here they had the combined advantage of the action of the sun's rays and the sand bath which is not unlike the mud baths which are given in our modern days.

After all, it was left to Finsen to separate the various rays and to exclude those which had dangerous effects and to retain those which gave therapeutical results.

It was left to Finsen to reduce the heat producing rays to a minimum.

THE ARC LIGHT IN THE EVOLUTION OF ULTRA VIOLET RAYS AS A THERAPEUTIC MEASURE.

The evolution of ultra violet rays as a therapeutic measure as well belongs to the ordinary street arc light. Garnault it was who mentions the radiations from an arc light as the accidental cure of a disease observed by a certain workman by the name of Touré who was afflicted with rheumatism and who was entirely cured because his work necessitated his remaining in close approximation to an arc light of great intensity;

and it was subsequently found that workmen associated with him, who likewise had to remain in the vicinity of this powerful arc light, were cured of such systemic diseases as rheumatism and gout.

It is well known that the ordinary arc light with the carbon electrodes, which is used for the purpose of producing light, has certain effects which are similar to the sun's rays regarding inflammation of the skin, consequent erythema and increased pigmentation.

In the evolution of light therapy it was found that the arc light was used as a substitute for the sun bath with the hope of producing a similitude.

Going back to 1880, certain experiments were developed at the Cornell University, which went to show the favorable influence which the arc light had on plant growth. At about that time the arc light was much used in therapeutics, a cabinet having been arranged so that the head was not enclosed, and certain colored screens were interposed between the patient and the light when it was found necessary to intercept the heat rays.

This was necessary so as to prevent what was known as "erythema electricum." This was demonstrated by Widmark, Charcot and others

to be due to the actinic rays which were put forth by the arc light.

In those days the arc light was presumed to simulate sun light more closely in its luminous and chemical power than any other known therapeutic agent; but to-day we have more efficient apparatus in the Kromayer and Alpine sun lamps and which have left the combined total of Finsen's efforts entirely in the background.

Even then it was found that exposure to the powerful rays of the arc light would cause the patient to suffer from "burning" of the skin not unlike sunburn, and even inflammation of the conjunctiva, also choriza and photophobia.

It was found with the arc light that the growth of tubercle bacilli were inhibited, and even then the patient's general individuality was not left out of consideration.

They employed all means to increase the patient's resisting powers, and so it is to-day with the use of the quartz mercury vapor lamps.

Freudenthal believed that while he never really cured a case of tuberculosis of the lungs with the use of the arc light, it was nevertheless a valuable treatment for this disease. He believed that the tegumentary covering of the chest was stimulated to greater activity, thereby increasing nutrition and improving general metabolism.

He also noticed that cases which were treated by the arc light had a gradual reduction in temperature, and he claimed then, in comparing it to treatment by hydrotherapy, that it was superior in more promptly relieving pain and in assisting expectoration.

Freudenthal, who had considerable experience in the treatment of tuberculosis with emanations from the arc light, found that it was of the utmost value in relieving symptoms in a very short period of time.

He also found that the arc light was of value in the treatment of ulcerative tuberculous processes, and in those conditions was far superior to any other means which were at hand.

He then used the arc light which was commonly used on shipboard, known as a "search light."

Crude as the methods were then, he used pieces of lint, which were kept cold by keeping them on ice to prevent heat radiation, and as they were gradually warmed by the effects of the light rays they were renewed.

In certain cases he used a screen of blue glass at the beginning of treatment until the patient had gradually become accustomed to the effects of the arc light.

We next come to the mercury arc light known

as the "Hewitt" light. It was fourteen years ago when Peter Cooper Hewitt, among the most prominent discoverers of that time, referred to light as a therapeutic agent. This lamp consisted of a vacuum containing mercury vapor, and it is upon this discovery practically that the modern quartz mercury vapor lamps are based.

In the Hewitt mercury arc light the vapor opposed a decided resistance to the passage of the electrical current until it reached a certain high potential, when it suddenly gave way and allowed to pass through it a low potential current. This, then, produced a light which gave out all rays excepting the red. The energy was, therefore, converted into chemical and luminous rays, while the heat rays were practically excluded. This was a decided advance in phototherapy.

ABANDONMENT OF SUN LIGHT AS A THERAPEUTIC AGENT.

Sun light as a therapeutic agent has been abandoned by the modernist as a source of light upon which he could depend absolutely and without interference for actinic rays. Of course, certain of the old type country practitioners in the mountainous regions still rely on the sun light, and for this we must give them credit.

We, in this location on the earth's circumference, have relegated it because of certain atmospheric influences and because the earth is surrounded by vapor and smoke and certain chemical constituents which prevent the curative or ultra violet rays from reaching the earth's surface. In our location there are but very few places where the sun could be depended upon to send its ultra violet rays upon terra firma. This was agreed upon even in the days of the electric arc light, it being then supposed that the arc light was particularly rich in ultra violet rays.

We must realize that the sun's rays are obliged to pass through various gases which surround the earth and have a wonderful absorptive influence upon the ultra violet rays, it being only the red rays which are allowed to pass through this strata, and they are the heat rays.

These various strata are recognized in the spectrum by the appearance of numbers of absorption lines or black points. Each line represents a portion of the spectrum which has been absorbed from the light of the sun in its totality by something through which it has to pass on its way to the earth.

Four thousand lines and more were mapped out in the spectrum, and no doubt by this time

many more have been added through careful observation.

This will make us realize that the sun's ray as it reaches the earth is after all not so rich in its chemical properties as we might believe, therefore making us depend all the more upon artificial sources for the therapeutic rays which the sun gives forth, namely, the ultra violet rays so admirably supplied by the modern quartz mercury vapor lamps.

It has long been known that the ultra violet rays from an electric arc light were much richer than those produced by the sun, and as the sunlight can only be used in high altitudes for its chemical effect, we, in this region, must depend upon an artificial production of these rays, and as the artificial production is even much richer in ultra violet rays than the sun could possibly produce in our locality, it is, therefore, obvious that we should not be much concerned about the sun.

REASONS FOR THE DISAPPEARANCE OF THE USE OF THE SUN'S RAYS AS A THERAPEUTIC AGENT.

The evil effects which have followed the unscientific technique which has been employed from time to time, a typical example of which

is the "glacial burn"—an acute dermatitis which in the majority of cases occurs after exposure to intense rays of the sun in high altitudes, sun baths, etc., was responsible for its long disappearance from the therapeutic field.

These phenomena were for a long time looked upon as the evil effects following exposure to the sun's rays, and even Kaposi was of the opinion that it was the heat rays and not the light or chemical rays which produced the burn.

This theory is contradicted by Hammer, of Stuttgart, whose experience demonstrated that just the reverse is true—that is, that it is the light rays and not the heat rays which provoke the inflammation.

Hammer's experiments were followed by those of Widmark and more conclusively by Finsen. Upon these experiments was laid the foundation of light therapy as inaugurated by Finsen, and it has been some time since Rollier and Bernhardt firmly established the position of heliotherapy by the publication of their remarkable results with natural sun light at high altitudes.

It was early recognized that the good effects of sun light were not so much due to the red or heat rays as to the cold violet and ultra violet rays of short wave length; but as these latter rays

are only available in high altitudes above the vapor zones, and as the sun light is not always to be had in any desired intensity, the value of an artificial source of light which could be properly regulated is readily understandable and its advantages were recognized by many of the early investigators.

Finsen, after years of experimentation with the natural sun light, found the carbon arc to be a light rich in blue, violet and ultra violet rays. He was also the first to devise a way of removing all heat waves from the light, thus making it possible to use pressure upon the tissues for the purpose of securing deep penetration of the rays.

Thus, while all progress in light therapy must be credited as originating from the experiments of Finsen, it has remained for others to perfect lamps which have proved to be inexpensive and economical from the standpoint of current consumed.

The next important step, which, however, was preceded by the unsuccessful appearance of the iron arc and Uviol lamps, was the inauguration of the quartz mercury vapor or Alpine Sun Lamp.

Quartz is almost completely transparent to ultra violet rays, and as it can be heated to a very high temperature without danger of injury, it is

now possible to construct lamps of great power and at the same time economical from the standpoint of current consumed.

As an illustration of the strength of the quartz lamp as compared with other lamps, the time required for exposure to secure a desired result is one-half that of the iron arc and one-fifth that of the Finsen lamp.

Professor Kromayer was one of the first (about 1904) to use the quartz light as a therapeutic agent. In subsequent years there has been perfected a high pressure lamp which now bears his name, and so elastic is it in its application that it covers a large portion of the field of dermatology.

ULTRA VIOLET RAYS VERSUS OTHER PROCEDURES IN THE TREATMENT OF DERMATOLOGIC AFFECTIONS.

The x-rays, radium and surgical procedures have their place in dermatologic practice. True it is that there are certain cases which these methods of procedure will reach, and true again it is that there are a host of cases which they cannot reach, or if they can they are not at all superior to ultra violet influences.

The public has its prejudices against x-rays, which are indeed hard to overcome, even though it is well known that with modern methods there is practically no harm to be expected after x-ray exposures. However, the public still continues to keep this in mind.

The author has often had to answer the questions of his patients as to whether the ultra violet rays have any bad effects similar to those of the x-rays, which, of course, they do not have.

The public mind is as well prejudiced against the use of the knife when it can be obviated. This is a natural psychological problem. The author has refrained entirely from using the knife even in the treatment of lupus, preferring to use the author's method of electro-dehydration (so-called dessication) for the removal of tissue whenever necessary. (See author's article, entitled "A New High Tension Apparatus and Its Efficacy in Electro-Dehydration and Thermo-Albumenization as Designed and Perfected by the Author," Hahnemannian Monthly, February, 1916; also author's article on "Epitheliomatous and Pre-Epitheliomatous Lesions of the Mucous Membranes of the Buccal Cavity with a Demonstration of a Successful Method of Treatment by Thermo-Albumenization," Hahnemannian Monthly, October, 1911.)

Certain it is beyond dispute that ultra violet radiations are much more rapid in their results in comparison with other methods used, and just as certain is it that these rays are absolutely devoid of danger upon which all authorities seem to agree, and particularly the well known dangers of the x-rays when they are used in the hands of the incompetent, both to patient and operator alike.

At a meeting of the Royal Society of Medicine of London it was announced that clinical workers with radium may ultimately find that instead of curing cancer, they may as well succeed in producing cancer; and let us bear in mind that the occurrence of epitheliomata following constant and protracted x-ray exposures was prophecied long before their occurrence really took place. No such dangers are possible with the use of ultra violet radiations.

There have been many chemical substances both in combination and alone which have been advocated from time to time, particularly in the treatment of lupus of both forms, and other dermatologic neoplasms.

Surely the action of the ultra violet rays can be regulated to better advantage than the local use of such substances as pastes, acids and vari-

ous other caustics, the operator always having the action of the rays, whether with the use of the Kromayer lamp or the Alpine lamp, at his minute control, being able to regulate the depth of treatment by the pressure exerted, the time consumed and the interval of treatments.

It is a well known fact that such substances as silver nitrate and many of the acids produce albumenites, thus merely healing over the affected part but constantly irritating it and acting as a stimulant, urging on the growths to renewed life and activity.

Ultra violet rays can be applied to any portion of the cutaneous surface, and with the use of the quartz rod to the cavities as well.

Surely, from the cosmetic standpoint, there is nothing to be achieved which could be more successful or beautiful in the end-results than those attained by the use of ultra violet radiations, either by deep penetration or surface exposures. Furthermore, ultra violet radiations can be used about the orbit or other orifices without any apparent detriment whatsoever, which is not the case when the more common escharotics are used.

The question of cost is as well of importance. When one has to consider the scarcity of radium and radio-active substances, naturally the cost

must be considerable in comparison to that which is necessary to produce ultra violet radiations.

Again, we must bear in mind the most admirable end-results to be obtained by the use of ultra violet radiations when compared with the use of chemical combinations, various acids, alkalies, caustics, arsenic pastes, and the like, which should never be used because of their inability to deeply penetrate; because of their lack of control, and lastly, because of their ever-ready tendency to form unsightly scars and their predisposition to want to again break down and degenerate with even greater activity than previously existed.

Ultra violet rays, therefore, show their superiority because of their being easily obtained, cheapness, minute control of action, accessibility of areas to be treated, both general and local, including the orifices, absence of pain, ability to reach areas beyond the involvement, absence of danger, lack of violent reaction, cosmetic results obtained, and apparent absence of tendency to further degeneration.

PART II.

PHYSICAL EFFECTS, HISTOLOGICAL CHANGES, PATHOLOGICAL CHANGES AND BACTERICIDAL PROPERTIES OF ULTRA VIOLET RAYS.

Physical Effects:

The first studies of the physical effects of the sun and arc light were by Bouchard as early as 1877, who found that different colored rays affected the epiderims in quite different ways.

He found that the red rays from the sun focused upon the skin by use of a prism produced no results after thirty seconds' exposure. However, he noted that the violet rays were quite capable of producing a bleb, and that as much as eighteen minutes were needed for the green and yellow rays to produce erythema. This same erythema was produced in fifteen minutes by the blue rays and in twelve minutes by the violet rays.

In modern observations with the present methods of producing ultra violet rays the same reactions are noted following the therapeutic application of the rays, and that is that the effect

comes on some hours after and gradually increases for forty-eight hours, when it begins to recede and is followed by desquamation which is complete in from five to eight days.

Histological Changes:

Finsen in his investigations showed the histological changes which took place in the tissues of a tad-pole when they were exposed to the solar rays. The tad-pole was surrounded with filter paper, which was first moistened with water and then studied under the microscope, being exposed to the rays of the sun.

After ten or fifteen minutes changes began to occur. The capillaries were dilated, the blood stream slackened, and diapedesis took place, as in any ordinary simple inflammation. It was also noted that the red blood corpuscles were contracted.

In the studies of Leredde and Pautrier, erythema was produced by exposures of the skin of the arm to the rays of the electric arc. There were two exposures of seventeen minutes each.

The skin upon being excised immediately following the exposure showed a dilation of some of the blood vessels. Another excision was followed within twenty-four hours, the epidermis

showing marked evidences of vesiculation; the microscope showing marked œdema of the derma with slight suppuration of the connective tissue. There was as well dilation of the blood vessels, also of the perivascular interstices and some cellular infiltration. There was some proliferation of the fixed cells. The corneus layer was slightly exfoliated in certain areas. There was dilation of the endothelial cells showing karyokinesis. Some of the connective tissue cells were swollen and karyokinetic. Mast cells were increased and a general condition of inflammation existed. The microscopic changes further showed the influence upon the deeper structures, demonstrating the penetrative ability of the chemical rays.

Pathological Changes:

Investigation of the pathological changes in the skin brought about by the influence of ultra violet rays was made by Macleod and also by Glebowsky.

It was found that the prickle cells of the epidermis were swollen and lymph spaces were found here and there dilated so as to form minute vesicles. The blood vessels of the superficial strata were surrounded by small mononuclear cells and were dilated.

Macleod's conclusions were:

First.—That the action of the actinic rays upon lupus is decidedly destructive, and that this process is indirectly produced, being the result of inflammatory reaction.

Second.—That the influence of the rays upon the surrounding undiseased tissue was negligible.

Third.—That with judicious employment of the rays the destructive process was not of such intensity as to inhibit consequent repair, and that within forty-eight to seventy-two hours thereafter it has reached a reconstruction stage which is quite like that taking place in the healing of any inflammation.

Fourth.—That the reconstruction process is quite able to replace the destroyed tissue with healthy fibrous tissue, forming a scar which is pliable, and that the surrounding epidermis recovered in toto from the secondary œdema caused by the rays.

Bactericidal Properties:

There is no doubt at the present time of the ability of ultra violet rays to annihilate bacteria. Downes and Blunt gave their first results as early as 1878, demonstrating that it was the chemical rays which were the most active in killing bacteria.

Finsen demonstrated that direct sun light killed the bacillus prodigiosus within one hour, while it took an arc lamp nine hours to kill a culture of the same bacteria.

He then experimented with the effects of concentrated light upon the same bacillus as well as the typhoid bacillus, and he found that these bacteria were killed fifteen times more readily by the concentrated method than by the direct effects of the light, and that the concentrated arc light was still more powerful.

The bactericidal influence has always been looked upon as the chief factor in radiotherapy in destroying lupus. Nagelschmidt in 1902 demonstrated conclusively that the chemical rays of light absolutely killed bacteria, and thus the morbid processes were stopped and absorption of their products became possible.

Jansen demonstrated that bacteria at a depth of two millimeters in the skin could be killed by chemical rays.

It must be borne in mind that the bactericidal influences of the ultra violet rays depend upon the intensity of the radiation on the one hand and resistance capacity of the bacteria on the other; also on the type and qualities of the bacteria, and that their destruction is dependent entirely upon the intensity of the radiation.

PART III.

ACTION OF ULTRA VIOLET RAYS IN DERMATOLOGIC PROCEDURE.

Ultra violet light acts as a decided irritant to the outer layers of the integument. The vitality, therefore, of numerous skin cells is decidedly damaged, and in order to take care of this damage there is a dilation of blood vessels with consequent hemorrhage as a means of removing the dead and damaged cells; in other words, resorption takes place, the destroyed epithelium being replaced through increased cell division and the very superficial layers being entirely exfoliated.

A further action of the ultra violet rays is a decided bactericidal action. Various bacteria are quickly annihilated. There is no doubt but that at first there is a marked increase in the number of bacteria due to the increased blood stream, but, secondarily, there is rapid destruction.

Ultra violet rays have a decided influence upon the cutaneous nerves, the rays being antipruriginous and nerve irritation is at once reduced. There is as well a general stimulating effect upon the entire economy, particularly when the entire body is rayed.

The rays, therefore, have the ability to produce congestion, remove exudates and cause desquamation of the epidermis.

It must also be borne in mind that systemic effects are gained by the use of ultra violet radiations on the body generally because of the production of ozone which results in an increase of oxygen in the blood stream.

It must also be remembered that ultra violet absorption does not take place in the oxygen alone of the red blood corpuscles but also in albumin substances.

The microscope in the hands of the author has demonstrated that there are practically three factors of importance which would admirably assist in explaining the action of ultra violet radiations in the treatment of cutaneous diseases, namely, thrombosis, injury to the tissues, and inflammatory reaction. This is particularly so in the treatment of nævus flammeus with the use of the Kromayer lamp. In the occurrence of thrombosis there is gradual shutting off of the blood supply to the area treated. Naturally this must follow the injury to which the blood vessel walls have been subjected after the deep penetrative radiations. In the cases microscopically studied by the author there was shown a pour-

ing out of lymph and leucocytes, the former acting as a continual flusher of the diseased areas, and the latter, by their action of phagocytosis, assisting in the removal of the products of inflammation.

The normal cells, being of greater vitality than the abnormal ones, usually are apt to react to normal after the radiations, while the abnormal cells or those of lower tone or vitality usually succumb.

Might we not, as well, assume that there is possibly produced an autogenous reaction by the absorption of these products of inflammation which in turn must have their beneficial influence upon the growth to be removed?

PENETRATIVE ABILITY OF ULTRA VIOLET RAYS.

There can be no doubt of the positive proofs of the ability of ultra violet rays to penetrate deeply into the tissues. That the Kromayer lamp under compression can penetrate because of dehematization is, of course, beyond dispute. That the ultra violet rays from the Alpine sun lamp can as well penetrate deeply into the tissues can be demonstrated by observations on the ability of ultra violet rays to penetrate from the time of

Finsen on down. Jansin's early experiments upon the ears of rabbits demonstrated the ability of ultra violet rays to penetrate and are well known.

Gebhardt was enabled to show the bone of the hand by photography with the use of a nine ampere lamp. Franklin and Gottheil proved conclusively the ability of the ultra violet rays to penetrate by making photographs of the body of a boy. Godneff proved the ability of the sun's chemical rays to penetrate the skin by putting silver salts in a tube underneath the skin of animals. Finsen proved the power of trans-illumination of concentrated light.

Schultz, in his experiments upon the power of penetration of ultra violet rays, ends his conclusions by stating that "the penetrating power of the ultra violet light is, therefore, greater for human and animal skin than previously known, and can for that reason be looked upon as a directly releasing factor in explaining the depth of action."

INFLUENCE OF PIGMENT IN THE ACTION OF ULTRA VIOLET RAYS.

It has been scientifically demonstrated that after the first exposure to ultra violet radiations there appears a dermititis which heals under an

accumulation of pigment. If after a definite time a second exposure is given of the same time and duration as the first there is no visible skin reaction.

This demonstrates the protective action of the deposited pigment against the penetration of the light rays. It must be borne in mind that the papillary layer, as well as the blood vessels, nerves and pigment cells and also the cells of the epithelium, are influenced by the first exposure but not by the second exposure under given conditions. This shows why it is possible for the skin to become accustomed to the action of protracted exposures to ultra violet rays without further inflammatory reaction.

It must be remembered that the pigmentary deposits are extracellular, and, therefore, are not permanent, and that in due course of time they are readily absorbed.

This also shows that it is impossible to produce permanent pigmentary deposits in certain diseases of the skin such as vitiligo, where there has been an absolute destruction of pigment or a lack of formation thereof.

The well known tan brought about by exposures to the sun is the result of pigment formation. Linser claims that pigment is formed by

the sebum producing cells, and that sebum and pigment are very close chemical relations, it being a well known fact that people who are dark complexioned usually have a more marked sebaceous secretion.

Meirowsky is of the opinion that pigment is a production of cell nuclei which are produced independently of blood and hæmaglobin.

Weidenreich is of the opinion that pigment in conjunction with sebum acts as a heat regulator for the entire economy.

Diesing presumes that the pigment in the skin causes resorption of the ultra violet rays.

One may, therefore, conclude that the pigment not merely acts as a protector against the irritating properties of the short waves of the ultra violet light, but also will explain some of the absorption effects of the rays.

PART IV.

SOURCE OF ULTRA VIOLET RAYS.

Kromayer Lamp—Alpine Sun Lamp.

THE KROMAYER LAMP.

Professor Kromayer, who in 1904 was among the first to apply Quartz Light therapeutically, soon found that on account of the heat developed by the early types of burners, an intensity adequate for the treatment of the more serious skin affections could not be obtained. Moreover, he desired to investigate the penetrative power of the rays when pressure was applied to the affected tissues, and, therefore, suggested a method of cooling the burner by means of circulating water. During subsequent years various lamps were constructed according to these suggestions, finally perfecting the powerful, high pressure lamp which now bears Prof. Kromayer's name, and has been adopted by hundreds of skin clinics and dermatologists in this country and abroad.

Description:

The Kromayer Lamp is constructed only for use with direct current, 90-250 volts. Where the

1. Kromayer Lamp for Alternating Current

electric supply available is alternating current, it is necessary to provide a motor generator set.

The lamp consists essentially of three parts, the Burner, the Rheostat and the Stand upon which the whole is mounted for convenient use in any position. (Frontispiece.)

THE BURNER is composed of the ∩ shaped arc tube "a," Fig. 2, about ¼" diameter, with the mercury containers "bb" and the outer jacket "d" all made of pure transparent quartz (fused rock crystal). The mercury containers "bb" form the electrode vessels, to which the current is conducted by the ground-in, mercury-sealed electrodes "cc."

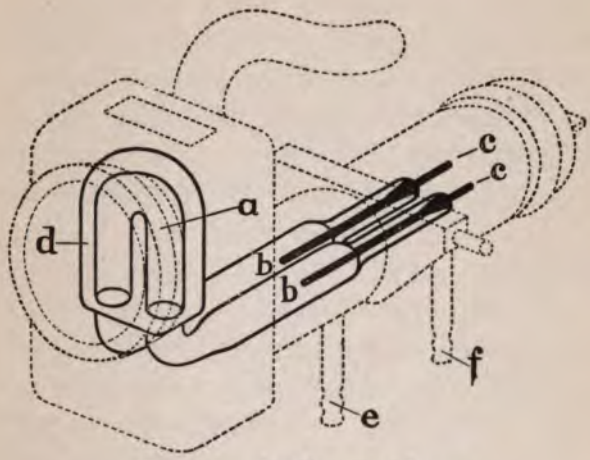
The Burner is mounted in a water-tight metal casing and emits its rays through a quartz window in front of same. By tilting the casing forward on its pivot, metallic connection is made by the mercury from "bb" joining in the arc tube. Then, on restoring the Burner to its original poise, the arc is struck, filling the whole of the arc tube. The Burner is kept cool by a flow of water which, entering the casing at "e," passes all round the jacket "d" and issues at "f." The jacket, which is partially evacuated, prevents excessive cooling of the arc tube, which would reduce the intensity of the rays emitted.

THE RHEOSTAT is specially constructed for use with the Kromayer Lamp. It is housed in a cylindrical metal case with slate top and mounted directly upon the Lamp Stand. (Frontispiece.) Fitted on the cover plate is an indicating switch to turn the current on and off; a plug and socket to connect lamp to Rheostat; a current direction indicator to show when lamp is correctly connected, and a regulating switch for varying the intensity of the light.

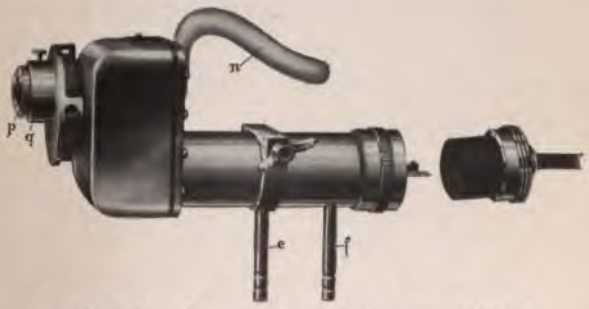
THE STAND comprises a tripod base equipped with leather covered ball-bearing casters, a polished and nickeled steel upright and a cross-arm, similarly finished. The latter is forked at one end to form a pivot for the lamp and can be adjusted at any desired height or angle. Where it is necessary to hold the lamp in the hand during prolonged exposures, its weight can be counter-balanced by attaching the cord to the handle. The cord runs over a pulley at the top of the stand and is attached to a counter-weight traveling in the upright.

The following table shows the normal consumption of the lamp with various working pressure:

Line Voltage	90	100	110	120	150	200	220	250
Normal current consumption, amperes	5	5	5	5	3.5	2.7	2.7	2.7



2. Burner for Kromayer Lamp



3. Attaching Quartz Lens Applicator to Window

At the moment of lighting and for a few minutes afterwards, the consumption is 30-50% higher than these figures. They show that at 10c. per unit, the operating cost of a 110 volt lamp is 5½c. per burning hour, that of a 220 volt lamp about 6c. per hour. There is no maintenance cost involved beyond reblowing burner about once a year when it has become cloudy.

Quartz Applicators. For use where compression treatment for deep penetration of the rays is indicated, in positions not easily accessible when using the standard quartz window lenses cut from rock crystal are furnished. They are mounted in metal frames and hooked on to the window ring in front of the lamp as shown at "q" in Fig. 3. Lenses of three different sizes are available, two of circular and one of square cross section as shown in Fig. 4, Nos. 2202, 2203 and 2204.

To reach cavities in mouth, nose, ear, etc., and for urethral work, quartz rods as 2007 and 2008 are used. The coefficient of refraction of quartz is so high that the light is transmitted through the rod as through a tube, issuing only at the end. A special holder is furnished with these rods (No. 2006, Fig. 4) equipped with a shutter "r" for instantaneous cutting off of the light. This

is valuable for very short exposures as when mucous membranes are under treatment.

BLUE FILTERS. Much deeper penetration can be secured and longer compression radiations given when the long wave heat rays and very short wave ultra violet rays are entirely eliminated from the light. This is accomplished by inserting discs of blue "ultra violet glass" into the lamp behind the quartz window (No. 2009, Fig. 4). These are made in four thicknesses, 2, 3, 4 and 5 mm. to permit any regulation of the light.

THE SHARPE LOCALIZER. When treating small lesions by distance radiation, it is important to efficiently protect surrounding areas of healthy tissue. This is most conveniently done by use of the Sharpe Localization Applicator (No. 2015, Fig. 4). It consists of three tubes, ½", ¾" and 1" inside diameter, which fit an ordinary lens holder, and when attached to the lamp window, confine the light to a circular spot 2½" from the burner.

THE ALPINE SUN LAMP.

Among those who early recognized the thera peutic value of the Quartz Lamp was Dr. Franz Nagelschmidt, Director of the Finsen Clinic. He

4. Applicators and Accessories for Kromayer Lamp

had opportunity to employ the Kromayer Lamp from the early beginnings and became convinced by the results he observed, that a much wider field might be opened for Photo Therapy by the production of a lamp with which large areas could be radiated, to emulate by this artificial means the natural mountain sun baths in an intensified form. A lamp constructed in accordance with his ideas was placed upon the market in 1907. It had an arc tube about 4″ long, surrounded by a small, cylindrical reflector case and mounted upon a pedestal after the manner of a domestic table lamp. A great deal of excellent work was done by Nagelschmidt with this lamp, particularly in the treatment of diseases of the scalp, in which he specialized.

A further modification was later suggested by Dr. Bach (Bad-Elster), according to which the lamp was suspended from the ceiling, fitted with a larger and more convenient reflector and shutter, and equipped with a tube through which the ozone generated in large volume by the light, could be inhaled. Bach showed the way to a wider application of Quartz Light treatment, securing good results in nervous conditions (neurasthenia, sciatica, lumbago, neuralgia), and in many constitutional diseases where an improve-

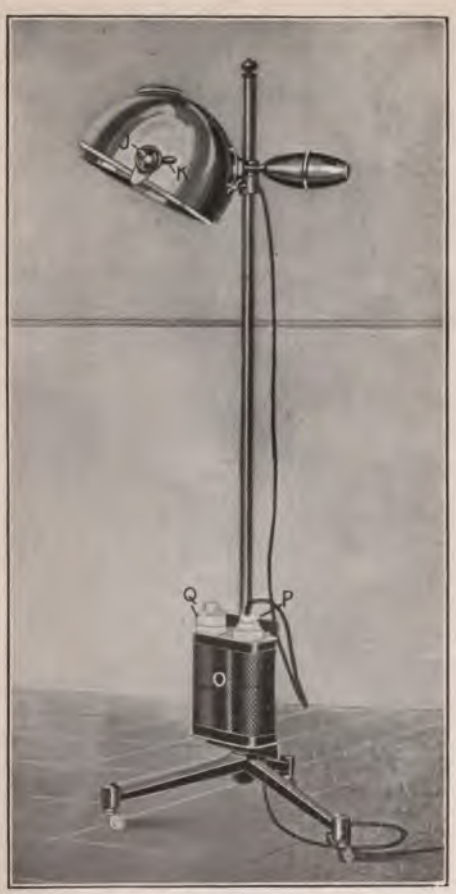
ment of metabolism was a vital factor (arteriosclerosis, gout, rheumatism, anæmia, diabetis).

Further improvements were made from time to time. The latest model of the Alpine Sun Lamp is manufactured by Hanovia Chemical and Manufacturing Co., of Newark, N. J., and is now available for use suspended from the ceiling, from a wall arm, or mounted on movable floor stand.

DESCRIPTION OF ALPINE SUN LAMP.

The Alpine Sun Lamp is made for direct current 90-120 and 200-240 volts, and for alternating current at the same pressures. The two lamps differ from one another in several vital particulars, and a direct current lamp cannot be used on an alternating circuit, or vice versa.

THE DIRECT CURRENT BURNER consists of an arc tube "a" (Fig. 6), about 4″ long, two transverse mercury containers "bb," and the electrode vessels "c," all of pure transparent quartz (fused rock crystal). The current is conducted through the lamp by ground-in, mercury-sealed electrodes "dd" to which leads "ee" are attached. Fan-shaped metal coolers "ff" are mounted on the mercury containers and serve to diffuse the heat generated at the electrodes, thus regulating the



5. Alpine Sun Lamp for Direct Current on Floor Stand

current density, and, therefore, the intensity of the light.

THE BURNER FOR ALTERNATING CURRENT (Fig. 7) has an arc tube 5″ long and two positive electrodes instead of one.

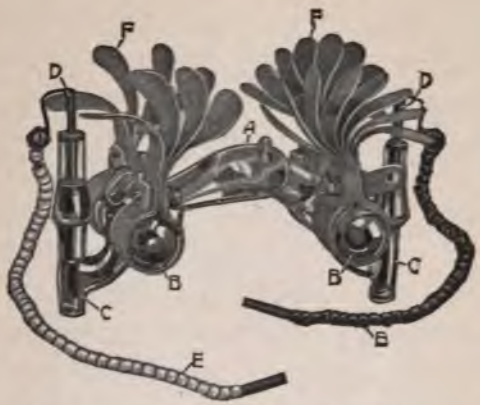
The burner is mounted into the lamp body consisting of two hemispherical reflectors of highly polished aluminum as shown in Fig. 8. It can be tilted from the horizontal into an inclined position by turning the hand wheel "g." This causes the mercury to make metallic connection in the arc tube, permitting the current to flow through. Then upon allowing the burner to fall back into the horizontal position the arc is struck, filling the whole of the arc tube. On direct current lamps, a current direction indicator "h" (Fig. 11) is fitted close to the hand wheel and serves to show if the lamp has been connected with the current flowing in the right direction. This device is not necessary in alternating current outfits. The lower half of the reflector body may be revolved around its pivots by turning hand wheel "i" and locked in any desired position by the lever "k." In this way the rays may be directed upon an area of any size at any desired angle. For local radiations at short distance an aperture "l" (Fig. 9) in the lower reflector is used. This is

furnished with a shutter "m" having several openings of different sizes, controlled by turning the wing nut "n." One of these apertures is covered with colored glass for convenient observation of the lighted burner.

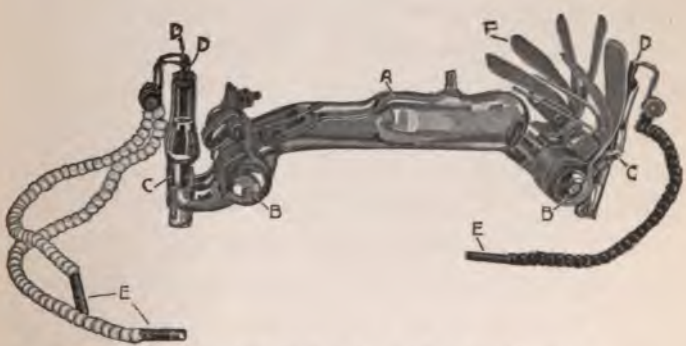
THE RHEOSTAT FOR DIRECT CURRENT. The current passes from the wall socket through a fixed resistance "o" enclosed in a perforated nickel plated casing and arranged to be hung on the wall as in Fig. 11, or attached to the floor stand as in Fig. 5.

The resistance is adjusted at the factory to suit the available supply voltage, and requires no attention of any kind by the user. These rheostats are specially designed and cannot be replaced by ordinary regulating resistances. The current is taken from the rheostat to the lamp by a plug "p" and cord, and controlled by an indicator switch "q."

THE RHEOSTAT TRANSFORMER for alternating current. The special requirements of the alternating current lamp are taken care of by the combination, with the normal rheostat, of a step-up voltage transformer, a very large choking coil with laminated iron core and two rheotan coils. The peculiar action of this combination, after the manner of a liquid rectifier, cannot be secured by



6. Alpine Sun Burner for Direct Current



7. Alpine Sun Burner for Alternating Current

an ordinary transformer. The whole apparatus is mounted in perforated metal case and stood on the floor near the wall socket as shown in Fig. 9. This also applies to lamps on movable floor stand, as the transformer is too heavy to be conveniently attached to the latter. Extra long leads with plugs are furnished for connections to transformer and thence to lamp.

THE FLOOR STAND. The most popular method of suspending the lamp is upon the movable floor stand shown in Fig. 5. This consists of a tripod base equipped with ball bearing casters having leather covered wheels, and a nickeled steel pillar. The lamp is balanced by a counterweight and provided with a bracket by means of which it may be held on the stand pillar at any desired height. As already mentioned, in direct current lamps the stand also carries the rheostat, thus making a well balanced, convenient and self-contained outfit.

CEILING SUSPENSION, by means of cord, pulleys and counterweight as shown in Fig. 11, may be resorted to where it will be satisfactory to use the lamp in one fixed position, as, for instance, for sun bath treatment, given simultaneously to several patients reclining on a bed or couch.

THE WALL BRACKET shown in Fig. 9 is sometimes found convenient in small offices or where

floor space must be economized. The bracket swings on hinges, and is provided with pulleys and counterweight accurately balancing lamp at any desired height. The arm has adjustable extension with a radius up to 4 ft. and is handsomely finished in oxydized copper.

Current Consumption. At 110 volts the lamp yields about 1,500 candle power and consumes 4 amps. At 220 volts the consumption is 2½ amps. and a light of 2,000 candle power is obtained. This shows the running cost to be about 5c. per burning hour. There is no other expense involved in using the light, neither is skilled attention necessary. The lamp has an exceedingly long life, the only renewals necessary being refilling of the burner about once a year.

The Hagemann Ring. Hanging Alpine Sun Lamps can be fitted with rings carrying 8 incandescent electric lamps as shown in Fig. 10. These were suggested by Prof. Hagemann and used by him at Marburg University Clinic, to imitate as closely as possible natural sun light (containing more heat rays than quartz light), and to give a sense of comfortable warmth to patients receiving general radiations. By switching on only certain of the lamps and by using bulbs of different candle power, any desired degree of radiant heat can be produced.

8. Alpine Sun Burner with Reflector Lowered to Show Burner, Tilting Mechanism and Reverse Side of Selective Shutter

PART V.

GENERAL REMARKS.

The author in his dermatologic practice has exclusively used the Kromayer Lamp and the Alpine Sun Lamp (manufactured by the Hanovia Chemical and Manufacturing Company, of Newark, New Jersey) as the source of emanation for ultra violet radiations, these lamps being far superior in their production of ultra violet rays to the iron arc which the author had previously employed.

Far superior as well are these lamps to the original Finsen lamps, it being possible to give longer and stronger applications without deleterious effects.

The author employs three lamps in his practice in the treatment of skin diseases—one Kromayer Lamp for its deep penetrative effect, always using the blue filter, and two Alpine Sun Lamps for surface radiations.

It is an absolute necessity to at least have one each of the Kromayer and the Alpine Sun Lamps to obtain the best results.

The author has not been much impressed with

the Kromayer Lamp for surface radiations except in the treatment of localized conditions. The Alpine Sun Lamp is ideal for treating the entire body if necessary, and one is thereby enabled to get the constitutional effects of the ultra violet radiations, there being no doubt at all of the ability of the system to react to surface radiations, because it has been fairly well demonstrated that even in surface radiations the rays do penetrate sufficiently to affect the blood stream.

In very severe cases of generalized skin eruptions it has been found advisable to use both the Alpine Sun Lamps upon the patient—one Lamp covering the head and chest, the other Lamp covering the abdomen and lower extremities.

The patient is placed upon a flat couch during the treatment. A couch with an elevated headrest is inadvisable because for obvious reasons the head and chest will receive stronger radiations than the lower portions of the body. If, however, it is not practicable to have a flat couch, the raised couch may be used, but the operator must, therefore, have the lamp at the raised portion at a greater distance from the body so as to compensate for the elevation.

It is of the utmost importance to bear in mind that surface radiations do have a constitutional

9. Alpine Sun Lamp for Alternating Current on Wall Bracket with Balance Weight, Transformer Shown in Foreground

effect upon the economy, and that it is always advisable in the treatment of the more chronic skin diseases to give general radiations for their systemic effect, particularly in those of a tubercular diathesis.

True it is that ozone is generated from these quartz mercury vapor lamps, and the patient not only receives beneficial results from inhalation but as well from absorption by the blood stream.

Patients who have had long and protracted treatments of general body radiations will often state that they have been able to taste and exhale the ozone content which their bodies have absorbed.

It is advisable to have the treatment rooms well areated so that patients who are receiving long treatments will not have any effects from too much ozone inhalations.

Mild dizziness or slight headache is usually the only untoward effects which readily disappear on reaching the fresh air.

In the three treatment rooms which the author uses in giving ultra violet radiations, a six inch electric fan just above the entrance keeps a constant circulation of air going on, so that he has never had any complaints from his patients in that direction.

nences the patient will at times more or less complain.

In using both of these lamps the novice is usually more or less timid in his first procedures. The manufacturers also caution the operators too much. Ideal results are often not obtained because of this over-timidity.

No harm can come from over-exposures. Nature quickly asserts itself and there is, therefore, nothing, to fear. It is better for the operator to get results from over-strenuous radiations than to have no results from under exposures. It is wise, however, to always caution the patient as to what might happen and thus put them on their guard, and when they are foretold of such possibilities they are perfectly satisfied. When not told they become intensely alarmed, and it is much harder to satisfy the patient's mind afterwards with explanations than it would have been previously with a mere forewarning.

The author has found, after considerable experience, that decided reactions are necessary and essential in the treatment of certain dermatologic affections, which he takes up fully under the various skin diseases mentioned under "Therapeutic Technique."

One must bear in mind that ultra violet radia-

tions are not to be considered the whole sum and substance of dermatologic practice. One should do everything possible as far as the usual methods of procedure are concerned, both internally and externally, in conjunction with ultra violet radiations. Yet in certain skin diseases this is unnecessary, and naturally the patient is much more pleased when he does not have to resort to the usual greasy, local applications.

Internal medication and the usual hygienic procedures, however, should never be neglected; they should be carried on hand in hand with the exposures to the source of ultra violet radiations.

X-rays naturally have their place in the modern practice of dermatology. It is unfortunate, however, that the public mind is more or less biased to x-rays because of the harm which has resulted therefrom in the past, and although with modern technique these bad results have been more or less wholly obliterated, nevertheless the patient's mind is biased. With ultra violet radiations this is not so. The patient is fearless and is readily impressed with their efficiency because of the short duration of time necessary for the patient to see for himself the results which are being obtained. Since certain dermatologic affections succumb as readily, if not more so, to ultra violet radia-

11. Alpine Sun Lamp for Direct Current Suspended from Ceiling and Balanced by Counterweight

tions than to x-ray exposures, one can readily see the preference to be given to the former method.

It is always wise to caution the patient as to the accumulative effect of the rays and that they may expect burning and even blistering almost at any time. When they have been advised of this and they expect it, there is no admonishing of the physician because of that reaction.

It is remarkable how really beneficial these "burnings" are. The patients grasp the situation at once, especially after reaction has taken place. They then tell the operator upon their own free will how beneficial that "burning" really has been, and are impatient until the operator finds it advisable to again produce a "burning."

Some operators of these lamps, particularly with the Kromayer Lamp or after "burning" with the Alpine Sun Lamp, desist all further treatments. This is inadvisable. During the interim until full reaction has taken place, both with the Kromayer Lamp and the Alpine Sun Lamp, mild radiations should be given from a distance of at least three feet for short exposures of from five to ten minutes. These mild, distant radiations assist admirably in bringing about a reaction much more quickly than if it were left to nature alone.

There are certain skin diseases in the aged which are associated with rapid degeneration and consequent increased blood pressure, and as well associated with certain atrophic changes in the integument, in which it is very easy to demonstrate how ultra violet radiations do reduce the blood pressure.

The author has taken particular pains in noting this by taking the patient's blood pressure before, during and after cessation of treatments. The blood pressure is decidedly reduced, more so, however, in some cases than in others.

With the reduction in blood pressure there is always an amelioration of the existing dermatologic affection; particularly is this true in the treatment of such conditions as pruritis senilis, eczema in the aged, generalized seborrhœic dermatitis of the senile type, and of the concrete senile types of seborrhœa which are considered pre-epitheliomatous, and so on.

It is advisable to protect the patient's as well as the operator's eyes with dark glasses. Automobile glasses with the side flaps are particularly ideal.

It is also advisable to caution the patient, particularly when glasses are not being worn, not to look up into the light out of curiosity.

12. Hanovia Interval Timer

When children are being treated an attendant should always be with the patient because their curiosity knows no bounds, and when not on guard the child is very apt to want to see "what is going on." Permanent harm, however, does not result. The conjunctivitis, which appears usually within twenty-four or forty-eight hours afterwards, is only temporary and passes away without treatment in two or three days; although to satisfy the patient's mind that something is being done it has been the author's custom to prescribe a saturated solution of boric acid containing one grain of zinc sulphate to the ounce, five drops being instilled in each eye three times daily.

PART VI.

APPLICATION OF ULTRA VIOLET RAYS.

Kromayer Lamp—Alpine Sun Lamp.

Kromayer Lamp:

The Kromayer Lamp may be used for either distance radiation for surface effects, or for compression radiation for deep penetrating effects.

Before applying the lamp, however, the skin should be thoroughly cleansed with tincture of green soap followed by a mixture of equal parts of alcohol and ether.

Crusts, scabs and scales should be removed since these intercept the ultra violet rays.

Since healthy skin reacts more strongly to the light rays than the diseased tissues under treatment, its protection must, therefore, not be neglected.

To secure the best results it is important that the arc tube of the lamp is not clouded either by deposits from the circulating water, or on the inside of the arc tube from use, as a clouded arc tube will greatly reduce the intensity of the ultra violet rays, and, therefore, the effectiveness of the radiation.

Assuming that the lamp is in good burning condition, a safe rule is to move the rheostat lever (for patients with normal skin) on to the third stud, moving it up to "full" only for patients exhibiting a subnormal reaction, and moving it only to the second stud for patients displaying more than usual sensitiveness to the rays.

For the distance radiation of small lesions the distance usually employed with the Kromayer Lamp is about two and one-half inches from the lamp window. For convenience in such cases the Sharpe localization applicator is best employed (see illustration, figure No. 4-2015) which confines the rays to a circular spot two and one-half inches from the burner. Besides insuring the correct distance, the tubes cut off the light from the surrounding healthy skin and from the patient's eyes.

In treating larger areas the surrounding part should be carefully protected. A black cloth serves this purpose best, or a sheet of black paper with a hole cut in it corresponding to the lesion to be treated.

When it is necessary, however, to exactly circumscribe a definite area the most convenient method is to apply pieces of adhesive plaster around the edges to give a sharply defined

margin; any exposed parts outside the plaster being protected by some sort of dark covering.

As an alternative Dr. F. G. Harris, of Chicago, suggests the following paste: Tincture green soap, 50 parts; water, 50 parts; burnt umber, 15 parts; all rubbed up well in a mortar, and which is applied with a small brush to the healthy tissue to be protected. After the treatment the paste may be readily washed off with water.

It is important to bear in mind that the patient should be so placed that the surface under radiation is parallel to the window of the lamp.

Compression Radiation for Deep Penetrative Effects:

The object of the compression treatment is to produce a local dehematization through the pressure of the quartz lens on the tissues, to enable the ultra violet rays to penetrate into the deeper layers of the skin instead of being absorbed by the blood, and the surface capillaries as would otherwise occur.

In cases where for physical reasons it is not possible to exert a sufficient pressure on the tissues, either a subcutaneous injection or surface application of adrenalin may be used (see methods of dehematization, page 55), and the

lens may be merely placed against the surface without exerting any pressure upon it.

Generally the thicker the blue filter employed the greater penetration can be secured. At the same time the intensity of the rays penetrating the thicker filter will be diminished, and, therefore, the time of exposure must be correspondingly lengthened.

The lens selected should always be as nearly as possible the same size as the lesion to be treated.

If the lesion is on the face the patient can hold the lamp himself by resting his elbow on a table, or it can be held in position by the operator.

As long exposures are usually the rule, it will be found more convenient to bind the lamp in position by means of bandaging. The lens should be pressed firmly against the tissues to exclude the blood.

For the treatment of lesions occurring on the mucous membranes, special applicators are required. (See Fig. 4-2008.)

METHODS OF DEHEMATIZING.

Early in the studies of the effects of ultra violet rays upon the tissues it was discovered that where the deep penetrative action of the rays was

desired in the treatment of localized lesions it was necessary to dehematize or exsanguinate the areas to be treated.

Pressure naturally was the first method. In certain locations with pressure methods there are various discomforts which the patient would be subjected to.

It was Jamieson who employed adrenalin for dehematizing purposes. The use of a one to one thousand solution of adrenalin in the treatment of lupus was found ample, the dehematizing action lasting for as much as an hour.

Piffard took advantage of cataphoresis to drive adrenalin into the tissues, it being found that one minute was sufficient to produce dehematization of the unbroken skin which lasted from one-half to an hour.

Finsen, however, found fault with all methods to produce exsanguination of the tissues except that of compression.

Alpine Sun Lamp—Surface Radiation:

After lighting the lamp it should be allowed to burn for at least five minutes, the lamp during this period being closed. The treatment should not be begun before that time because the light does not reach its greatest maximum until at least five minutes have elapsed.

According to the area to be treated, the patient is placed in the best position possible in relation to the lamp. Protection of the surrounding areas must as well be carried out. (See under Kromayer Lamp, page 53.)

In treating women the operator should be careful to give additional protection if the patients are wearing thin blouses or waists with wide meshes as the rays will readily penetrate and produce mild reactions.

In treating skin diseases upon the face, or when general radiations are given to the entire body, the eyes should always be protected. The best means of protection is by use of dark glasses which have side flaps upon them. In the absence of dark glasses, black cloth, which is impenetrable to light, may be used.

Accidental conjunctivitis or even skin burns which may result are absolutely harmless and never result in lasting injury.

When the operator is treating a number of patients the Alpine Lamp should not be lit anew for each patient, but should be allowed to burn continuously, for in this way the same strength of the light is always available, and, furthermore, longer life is given to the burner by permitting it to remain lighted rather than by relighting it

anew for each patient. It is advisable, howev
to permit the lamp to remain half open duri
the interim between treating patients.

Caution the inquisitive against looking into t
lamp with naked eyes. Children should never
treated without an attendant present.

Have no fear of the effects upon the lamp
sudden changes of temperature, as quartz is i
sensible to such changes.

The arc tube of the burner should always
parallel to the surface under treatment.

Surfaces may be rayed either through ope
ings in the revolving diaphragm upon the lamp
by opening the lamp according to the size of t
surface to be treated.

In radiating the general surface of the bo
the lamp must be entirely open. The use of tv
lamps gives better results.

PART VII.

THE EFFECTS OF TREATMENT OF THE ENTIRE BODY UPON THE GENERAL ECONOMY.

Shortly after the patient is exposed to the rays, the body being entirely naked, the patient resting upon a couch entirely relaxed, the patient is gradually overcome with a feeling of restfulness and calmness which is gradually followed by drowsiness, and the patient will often pass away in the arms of Morpheus in a decidedly deep sleep.

It is important to advise the patients to relax, the author telling them to permit themselves to relax so completely as to feel as though they were going to drop through the couch. He as well advises them to put their minds perfectly at ease, forgetting their trials and tribulations in life, and to have nothing but pleasant thoughts. This assists admirably in getting complete relaxation.

The author has found that patients who were able to do this have slumbered so deeply that upon arousing them they were momentarily confused as to their location and as to what had happened.

So soothing has been the effect of generous

treatments upon brain workers and those with heavy business responsibilities that they have voluntarily returned for further treatments when they have been under an unusually severe mental strain.

Immediately after the treatment there is a general feeling of well-being and alertness, and those who have been troubled with insomnia have found a calmer and deeper sleep than they have known for many a day.

Their appetites, too, have increased, and they go about their work as though a new inspiration had entered into their lives.

In the giving of these general treatments both the anterior and posterior portions of the body should be rayed—the posterior first and then the anterior, so that perfect relaxation may be more easily attained in the end and the full effects of drowsiness may be better accomplished.

It is then that the patient will finally succumb to a full state of sleepfulness. This absolute state of entire relaxation may not appear for the first few treatments, but after the patient has gotten over the psychological effects of fear and misapprehension and has attained the goodwill and confidence of the operator, it is then that the best results are secured.

Pleasant surroundings and individual treatment rooms are necessary to obtain ideal results in this direction. Irritating color schemes, such as the reds, should not be employed. The greens or dark blues and the greys are more calming in their influence, and color schemes should, therefore, be constantly borne in mind when one desires particularly good results.

The busy practitioner, or even the specialist, is usually so taken up with his routine of daily duties that he is apt to relegate into the background very necessary and essential details of impression upon his patient's mind. He seems to forget that his patient is naturally apprehensive and suspicious as to what is going to happen. In order to get the best results with ultra violet radiations his first thought should be to assuage or calm the patient's mind by explaining just exactly what is going to happen.

In this modern age of ours patients like particularly to be told and to have explained to them the effects of the treatment which they are about to undertake. It helps admirably in the results to be obtained.

Patients, too, like to be told of the evolution of light therapy, and, as previously mentioned, it is the wise physician who acquaints himself with the history of light therapy.

Lay journals and the public press as well are full of educational data upon the latest methods in attaining therapeutic results, and to-day particularly are they full of the results of ultra violet radiations upon the general economy. The battlefields of Europe have come into play because ultra violet rays are being used there with such enormous success in the treatment of the wounded, so that the laity seek those who are proficient and up-to-the-minute in modern technique in their immediate neighborhoods who may employ ultra violet radiations in the treatment of the afflicted.

It is to be noted in general radiations of the entire economy that the pulse becomes fuller, that the breathing naturally becomes decidedly deeper, and that the heart beat is much stronger. However, the respirations and the heart beats remain unchanged. Diuresis is increased but the blood pressure is lowered (see Part IV, page 37). The red blood corpuscles, however, are not affected, but the white corpuscles are diminished.

Psychologically, particularly when a treatment has been too strenuous, a sensitive patient may suffer with congestion resulting in headache, ringing in the ears, and a general feeling of lassitude. These the author feels are all the result

of improper education of the patient. However, these untoward complaints are only momentary and soon disappear when the patient leaves the atmosphere of the treatment rooms. The author has never found it necessary to resort to the stimulative effects of spirituous liquors, etc., to bring about a sensation of well-being.

RESULTS OF OZONE INHALATIONS AS PRODUCED BY THE ALPINE SUN LAMP.

It is a well known fact that marked production of ozone takes place during the action of the Alpine Sun Lamp. It is advisable to instruct the patient to practice deep inhalations, both through the nose and mouth, for at least a period of five or ten minutes after the lamp has been in thorough operation.

The patient usually complains of a dryness of the mucous membrane of the nose and throat. This may be primarily due to the fact of breathing through the mouth, and as well due to the effect of ozonation. If, however, the ozone inhalations are continued for too long a period of time, there may be resultant congestion in the head and ringing in the ears. But these soon disappear upon reaching the fresh air.

VARIATIONS IN SENSITIVENESS TO ULTRA VIOLET RADIATIONS.

The operator should attempt in his technique to determine the various degrees of sensitiveness of his patients to ultra violet radiations. He should always have in mind whether the patient's skin is dry or moist, whether the epidermis is thin or thick, whether the patient tends to perspire with difficulty or with ease, and whether the skin is pale or turgid, or whether it is pigmented.

Naturally an epidermis which is dry and thin, and one which readily perspires or which is pale, reacts more readily to ultra violet radiations than those skins which are thick and those which are fat and which perspire with much difficulty and are pigmented.

The reaction qualities of the skin, too, must be borne in mind which is easily determined by dermographism, which is the artificial production of a wheal by the use of the finger tip or some pointed instrument drawn across the skin. This shows the marked reaction of the vasomotor system to external stimuli.

Those who respond readily to dermographism have unusually sensitive skins, and, therefore, react much more violently to ultra violet radia-

tions than those who do not have such an existing condition.

The author has, however, under "Therapeutic Technique" in the individual diseased skin states, fully taken up this matter.

It is also to be borne in mind that in certain diseases of the integument very strong and protracted radiations, even unto burning and bleb formation, are very necessary in bringing about the desired results. (See under "Therapeutic Technique.")

PART VIII.

COMMENTS ON TIME, PRESSURE, REACTION, PAIN, SCARRING, HÆMORRHAGE, EMBOLISM AND HYPERPIGMENTATION.

The results to be obtained in the use of ultra violet radiations in the treatment of dermatologic affections depends upon three factors,—the duration of time and the amount of pressure exerted with the use of the Kromayer Lamp, and the amount of time and distance with the Alpine Sun Lamp.

With the Kromayer Lamp the harder the pressure the deeper will be the penetration, and vice versa; the pressure and time and distance naturally being varied in the use of both of these lamps according to the effect to be desired. By varying all of these conditions the operator can get a range of action from that of the mildest to that of the severest.

Time:

With the Kromayer Lamp it is just as important that the duration of time should be varied as that the pressure should be varied. Certainly the

more superficial lesions, or those with but little tissue resistance, demand less time than those which involve the deeper structures, or where the epidermis is so intensely cornified as to act as a poor conductor. This also holds good with the use of the Alpine Sun Lamp.

It is always advisable to be accurate in timing the areas to be treated. The operator should never depend upon his mental idea of time but should always rely upon a convenient time-piece.

The author uses a very practical and dependable interval timer which is now supplied by the manufacturer of these lamps and which device fills a long-felt want in the hands of the operator.

This interval timer may be set for any period of time from a quarter of a minute to two hours. The clock is set at the desired interval of time and a convenient lever on the back of the clock is depressed at the moment of starting the treatment. This starts the clock and the hands slowly turn back to zero which rings the alarm and also causes the clock to stop, which is then ready for use again. (See illustration, No. 12.)

The author has three such time-pieces—one for each treatment room; each of the bells thereon having a different tone so that the operator can at once recognize which treatment room the patient is in.

The question of time must also be taken into consideration when treating those who are of fair complexion and have tender and more sensitive skins, in contrast with those whose complexions are dark and whose skins are naturally more resistant to ultra violet radiations.

The skin of infants and the young must be given shorter durations of time than the skin of those in adult life where it is naturally more resistant.

The interval of time between treatments naturally depends upon the acuteness or chronicity of the existing condition. The author as a routine procedure has insisted upon giving rayings three times during the first week in all cases, as in this way the operator can better observe the results of the exposures and can better use his judgment as to repetition of treatments.

The operator must not forget that if there has been a very long interval of time between treatments that the skin has lost all resistance and that the effect will be the same as in the beginning so that the operator must begin anew.

In the treatment of chronic conditions, particularly when the effects seem to be more or less at a standstill, it is advisable to allow an interval of at least four weeks, when the treatment should again be carried on, starting anew.

The exact time of treatment the author has taken up individually with each disease and is fully considered under "Therapeutic Technique."

Pressure:

In considering the amount of necessary pressure one must be concerned only with the Kromayer Lamp. In order to treat a lesion where deep penetration is necessary its location must be taken into consideration. Where the tissues are soft and flabby, as upon the cheeks, the abdomen or buttocks, naturally a greater pressure must be exerted than where the tissues have bony structures directly beneath them as, for instance, on the forehead, the anterior tibia region or the malar prominences.

Then, again, the types of conditions to be treated must as well be taken into consideration. The pressure would, therefore, naturally vary in treating such superficial conditions as chloasma, pigmentary nævi and the like in contrast with such conditions as keloid or the hard indurated patches of chronic eczema, etc., and pressure would as well have to be greater when considering the treatment of conditions having naturally horny and thickened layers of epidermis because these act as poor conductors and demand greater pressure.

Reaction:

With the use of the Kromayer Lamp one may note a decided erythema about the lesion treated immediately on removing the lamp. From one to three hours thereafter the lesion treated becomes somewhat darker, and it is then that a marked swelling or œdema takes place.

Upon close observation a fine network of darkened capillaries may at times be noted, particularly in the treatment of vascular nævi. Reaction greatly increases and becomes more intense during the following forty-eight to seventy-two hours, and then gradually begins to subside.

With the use of the Alpine Sun Lamp, and only in the case of blondes or those with very tender skins, will there be noted immediately after treatment a slight erythema of the skin. This reaction in brunettes is prolonged for at least three or four more hours.

Within twenty-four hours a decided redness sets in both with the Kromayer and Alpine Lamps, and may even go on to bleb formation. Within two or three days this erythema or decided redness, whichever may have resulted, gradually decreases, and it is then that pigmentation, varying in degree, may appear.

When the treatment has been strenuous there

is exfoliation of the epidermis the same as to be expected in any ordinary sunburn. With the production of pigment there is a gradual immunity produced and there is no further reaction.

As aforesaid under "Time," if the intervals between treatments have been protracted, then the same reaction again takes place. It must be remembered that reaction continues to take place for a long time even after cessation of treatments, particularly so in the treatment of port wine stains or "mother's mark."

Mild, superficial crusting may also be the rule in the use of the Kromayer Lamp, which usually disappears in from ten days to three weeks, depending upon the time and pressure. This crust, however, exfoliates in due time without the appearance of any scarring whatsoever.

In severe treatments with the Kromayer Lamp there may be a slight serum-like discharge. This, however, discontinues within forty-eight hours with the formation of the aforesaid scab, and after thorough healing takes place the skin is somewhat redder than the surrounding epidermis, which redness gradually disappears, leaving the area treated neither elevated nor depressed, but on a level with the skin, not at all contracted, and which, later on, assumes the color of the normal skin covering.

It has been demonstrated that reaction is much more intense in the earlier years of life than in those who are senile. More reaction is expected when working about the orbit of the eye which is associated with marked swelling, even closing one or both eyes. This, however, is harmless and usually disappears within the course of twenty-four hours, and sometimes during the night.

Pain:

The question of pain is a varying quantity depending a great deal upon the type and temperament of the patient. There is no question, however, but that there is some pain when using the Kromayer Lamp with decided pressure upon bony prominences or over areas in which there is a nerve in close proximity. This, of course, is to be expected. The pain, however, is never so intense as to be unbearable.

The author has noted in several cases which have previously had x-ray treatments that there is more or less pain. With the use of the Alpine Sun Lamp there is absolutely no pain whatsoever; rather a feeling of comfort and lassitude.

Scarring:

The ultra violet rays have the happy faculty of producing intense inflammatory reactions, even

in the deeper tissues without completely destroying the overlying layers of epidermis, so that a certain number of cutaneous cells are permitted to remain which have a tendency to prevent scarring.

Ectropion need never be feared in working at or about the orbits because there is no scar formation and hence no contraction.

Scarring as an after effect need never cause fear or alarm because ideal cosmetic results are always the rule; further, because of the superficial action of ultra violet radiations; superficial merely in the sense of the rays not penetrating deeply enough to have untoward effects, but sufficiently deep in their action to have systemic effects.

Hypertrophic scar formation in the hands of the author or in the hands of various other authorities has never been reported. Assuredly the end-result produced is certainly far superior and more beautiful than any produced by any other known method in the treatment of dermatologic affections. In fact, the end-results produced by ultra violet radiations should not be called scars because they do not deserve that appellation.

Normal epithelial regeneration usually seems to be the rule. True it is that the skin's surface is decidedly redder at times in contrast with sur-

rounding tissue, but in time it assumes a pinkish coloring and still later on seems to assume the normal coloring of the surrounding integument, it being a well known fact that the after-effects of ultra violet radiations seem to continue for a long time even after cessation of the treatments.

Hæmorrhage and Emboli:

In the treatment of the cavernous types of angioma the operator naturally would fear a possibly expected hæmorrhage because of the superficiality of the blood vessels and possible resultant embolism.

This has never been reported in the vast number of cases treated because of the fact that hæmorrhage is controlled by the resulting thrombosis, and embolism has been controlled because of the immediate reaction which takes place.

Hyperpigmentation:

Naturally one will find hyperpigmentation of the areas treated with the Alpine Sun Lamp, and hyperpigmentations occasionally around the outer margins of lesions treated with the Kromayer Lamp, particularly in severe radiations. This, however, in all cases is only temporary because this pigmentation is extra-cellular and nature in time asserts itself and absorbs the pigmentations which, therefore, consequently disappear.

PART IX.

THE AFTER TREATMENT FOLLOWING ULTRA VIOLET RADIATIONS.

This is usually not necessary with either the Kromayer Lamp or the Alpine Sun Lamp. Pain, which may be associated when treating over bony prominences, or along the course of nerves, usually rapidly subsides after cessation of treatment.

The patient should be particularly instructed not to use soap or water upon the areas which have been under treatment, because the use of these interfere materially with the proper formation of crusts which are so necessary with protracted or prolonged treatments. Scab formation, when it does take place, is nature's own method for protecting treated areas. No physician has yet been able to produce a more admirable protection for the areas treated than nature, and he must constantly admonish the patient not to interfere with nature's own method of protection of the treated areas.

When a dry, hard crust has formed it should not be interfered with; this is of great importance in the production of admirable end-results.

Lesions, which are of the non-infectious type, should be kept as free from secondary pus infection as is possible. While it is well known that the ultra violet rays are bactericidal in their action, secondary pus infections are usually not the rule except when patients are associated with unhygienic surroundings.

In the event of an unusually large bleb formation, which perhaps may become uncomfortable from tension, it should be carefully and aseptically opened at its base, but should not be further interfered with because again Nature's covering can in no way be so well duplicated.

However, if the bleb may have ruptured of its own accord and its covering in some way accidently removed, then a mild, non-irritating powder or lotion should be applied. (See author's "Elementary Dermatology" for formula of Pulveris Bismuth Subnitratus and Calamine Lotion, page 228.)

Care, however, should be taken that the dusting powder is not too thickly applied because of the ever-ready tendency for suppuration to want to take place beneath it which would interfere with ideal healing processes.

It is always of decided advantage to never try to interfere with the natural crusting or scab-

bing which may take place. If, however, crusting or scabbing does take place upon any portion of the body, the result of deep penetration with the Kromayer Lamp or general treatments with the Alpine type of lamp, they are to be left severely alone until Nature has decided they shall drop off.

If, on the covered portions of the body where the rubbing of the clothing would naturally interfere, it has been the author's habit to protect the localized lesions treated with the ordinary aerated vaccination shield, permitting free access of air which seems to be so necessary an adjunct for ideal healing processes.

Absolutely no covering whatsoever should be placed on the lesions treated upon the exposed portions. However, where secondary infection has taken place, the scab or crust may be removed and the lesion gently cleansed from time to time with saturated solutions of boric acid.

Occasionally patients will return with much alarm and concern because they have accidentally removed the existing scab or crust. This need not cause any unnecessary alarm because of the fact that Nature will readily form another covering.

Sometimes it will be found that in spite of care-

fulness scabs will be readily shed, only to form and reform until the final end result of healing has taken place.

At times, with very severe deep penetrative treatments, free exudation will take place. The patient should then be instructed to simply wipe away the existing serum, and always from below the lesion and never from its surface.

Frequency of Treatments:

There can be no set rule as to how often treatment should be given. Practice makes perfect in all things, and one's experience alone must demonstrate how often treatment should be given.

The author has given the benefit of his experience as to how often treatment should be given under "Therapeutic Technique," taking up this consideration with each individual disease.

When skin diseases are acute naturally the frequency would not be so often as when one is concerned with the treatment of more chronic conditions.

Again, when the deeper structures have been involved it is quite necessary that the frequency should be more often.

Let the rule be that thorough reaction should be permitted to establish itself before further strenuous treatments are given. This particu-

larly refers to the use of the Kromayer Lamp as no deep penetrative treatment should be given again until thorough reaction has established itself. However, as previously stated, the author has always found it of decided advantage in assisting reaction to give mild superficial rayings with the Alpine Sun Lamp during the time of reaction.

AFTER EFFECTS OF ULTRA VIOLET RADIATIONS.

Naturally ulceration and sloughing would be one of the first after effects to be considered. Fortunately, however, this is never the rule whether treating by surface radiations or deep penetrations.

The lesions or areas treated with ultra violet radiations, either with the deep penetrations with the Kromayer Lamp or surface radiations with the Alpine Lamp, seem to have the happy faculty of replacing the tissues destroyed hand-in-hand with the process of dissolution which is going on.

However, in the treatment of cavernous angioma, where the radiations have been unusually severe, a slight swelling may take place. This need not cause undue alarm because really after all in the treatment of those types of caver-

nous angioma which are associated with much fibrous structure, the disfigurement which previously existed is naturally decreased by this process of sloughing, which, therefore, is quite ideal. Because at the same time there are removed the superfluous structures; and, therefore, the after effects of "burning" (artificial sunburn) and even bleb formation are perfectly harmless because of their superficiality.

PART X.

THERAPEUTIC TECHNIQUE OF ULTRA VIOLET RAYS.

The author will now take up a consideration of the numerous skin diseases which respond favorably to the influence of ultra violet rays. These diseases will be considered alphabetically in their order. More stress will be laid upon those diseases which experience has demonstrated to be more susceptible to the influences of light therapy.

Time will be measured in minutes and distance in feet and inches. Frequency of repetition will be mentioned in days. The type of lamp used in the treatment under consideration will as well be mentioned, so that at a glance one will be able to immediately determine the type of lamp to be used, the time and distance and the frequency of repetition necessary for any given condition.

It is important for the operator to constantly bear in mind the patient's susceptibility in determining the time of the exposure and frequency of repetition of treatments.

In giving deep penetrative treatments with the

Kromayer Lamp the author has always used the blue filter; some operators have reported treatments without the use of the blue filter, the time of exposure being very short; with decidedly increased reactions. Sufficient data has not been accumulated at this time to warrant a further report.

ACNE.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of one foot has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of thirty minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments, and then twice weekly thereafter.

Various unusually chronic types of acne, including the markedly pustular, the indurated papular and the necrotic forms, have come under the author's care for ultra violet treatment.

These types, as is usual, have mostly all been associated with oily seborrhœa and marked comedo formations.

The sites of election of those treated were mostly upon the face and quite a number upon the chest, shoulders and back. Those upon the back were mostly of the indurated type consisting of firm, tense, reddish-brown papules which were quite indolent. A number of these cases were chronic ones which had been variously maltreated and had undergone all sorts of treatment including x-ray exposures, serum injections, and various vibratory treatments. It was very gratifying to note the marked and immediate improvement in the series of cases treated.

Some few cases of acute acne which came under observation had to be handled very carefully and quite superficial rayings were given with very short exposures. Marked peeling of the epidermis resulted in a large number of cases, particularly after protracted treatments, which was quite beneficial. Some light brown pigmentation as well resulted, which, however, being extra-cellular, slowly disappeared.

Some cases had suffered severe burnings, the result of accumulative effect, with marked dermatitis, puffing of the face even to the extent of closing the eyes. This, however, usually dis-

appeared within forty-eight hours, resulting in marked peeling with very decided beneficial results and without any harmful effect upon the patient.

Mild, soothing lotions were applied to counteract the effects of the burn and to give the patient relief.

The associated seborrhœas responded much more quickly than the acne lesions. Comedo formation ceased next in order, and lastly there was a gradual disappearance of the acne lesions themselves.

In the odd types of acne cachecticorum and acne necrotica scar formation, which is usually the end result, was markedly absent with the ultra violet radiations.

In the pustular types of acne all pustules should be carefully opened and their contents gently expressed previous to treatment.

ACNE KELOID.

LAMP: Kromayer Lamp.

DISTANCE: Immediate approximation under firm pressure.

TIME: First treatment twenty minutes to forty-five minutes, depending upon the thickness of the lesion.

FREQUENCY OF REPETITION: Ten days to three weeks.

Acne keloid, otherwise known as "dermatitis papillaris capillitii," being rather rare, is by no means susceptible to the usual methods of treatment. Excision usually has consequent return, and x-rays seem to be of little value in the treatment of this condition.

The author has had two cases of acne keloid, both of which responded admirably to the deep penetrative method of treatment with the Kromayer Lamp. Both types were upon the back of the neck, which is its usual location.

The lesions consisted of numerous papules which were firm and coalesced, forming odd shaped patches quite keloid-like in nature. One case was associated with marked odor and more or less secretion. The results were unusually good, there being no scar formation. There was, however, a slight hyperpigmentation of the borders which gradually faded away.

Previous to the application of the lamp the area to be treated should be thoroughly cleansed, any adherent scabs or debris to be carefully removed. The surrounding skin should be protected in case the quartz crystal selected should be too large, adhesive plaster being cut to fit the area to be treated.

It is important to remember that the lamp should be distinctly at right angles to the lesion.

Pressure must be constant and firm. The tendency of the patient will be to relax and the operator should continually remind his patient to keep up a constant pressure. Bandaging the patient to the lamp with a firm bandage about the chin and the lamp will be of valuable assistance in keeping up an even pressure.

If the entire area has not been treated at one sitting, then forty-eight hours later another area may be treated, it being advisable to treat an area distant from the previous location, and so on until the entire lesion involved has been covered.

The time of repetition of any separate area treated, of course, will depend upon the reaction which has taken place. If the treatment has been severe, consequent swelling with even bleb formation will take place, which is usually followed by scab formation, ten days to three weeks intervening before the scab loosens and drops off. If the result has not been satisfactory at that time then the deep penetrative treatment is renewed until satisfactory results are obtained for each area treated.

ALOPECIA (Baldness).

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment two feet, decreasing six inches with each successive treatment until a minimum distance of one foot has been reached.

TIME: First treatment ten minutes, increasing five minutes with each successive treatment until a maximum of thirty to forty minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

Ultra violet radiation has demonstrated its usefulness in premature baldness, both of the idiopathic and symptomatic types. The premature alopecia of the idiopathic types of slow development, usually extending over a number of years, have responded very well to this method of treatment. In these cases there usually has been an hereditary predisposition.

In symptomatic alopecias which have been rapid in their development, particularly after serious illnesses, and as well in the types of slow evolution, being the result of seborrhœa and other scalp diseases, the results have been very prompt and satisfactory. Quicker results are usually had in the treatment of the two latter types.

With senile alopecia, which usually begins on the anterior and temporal regions and slowly progressing with oncoming senility, associated with the usually atrophic conditions of this age of life, there is little to be expected and the author has not had very satisfactory results even after

treating one case for over a year without interruption.

In the treatment of alopecia following febrile diseases such as typhoid fever and the like, one can readily see the advantages to be gained with ultra violet radiation particularly because of its stimulating effect.

In the treatment of premature alopecia due to seborrhœas in which the bottle bacillus of Unna and the micro-bacillus of seborrhœa are the causal factors, the results here obtained are due to the bactericidal effect of the rays upon these particular bacteria. Dandruff is always a constant factor in this latter type of alopecia, and is simply loaded down with myriads of the aforementioned bacilli. It is remarkable to see how quickly the dandruff will disappear after exposure to the ultra violet rays.

It is to be remembered that many of the rays are absorbed in dark haired people, and, therefore, longer exposures are necessary than in those having light hair. Where there is an abundance of hair the hair should be parted from time to time so that the rays will be enabled to penetrate and reach the scalp. It has been the author's custom, particularly in treating women, to have them continually part the hair during treatment

with a comb, their hands, of course, being protected with a pair of dark gloves.

ALOPECIA AREATA (Circumscribed Baldness).

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment one foot, focusing rays through lamp apertures to cover the affected area, decreasing distance to six inches after third treatment.

TIME: First treatment ten minutes, increasing ten minutes with each successive treatment until one-half hour exposure is given.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

In the treatment of alopecia areatas, which have presented themselves by the sudden disappearance of hair from the scalp or bearded region, good results are to be expected. Time, of course, is the keynote. As a rule, the younger the individual the more prompt is the response to treatment. One can hardly expect very good results in treating alopecia areatas in later life. The author, however, has had unusually good results in the treatment of alopecia areata even in those past fifty years of age.

In the treatment of one case in a male fifty

years of age in which the lesions were both on the scalp and bearded region, decidely circumscribed, variously sized, and which were quite smooth and lustreless, of over a year's duration, and in which all sorts of topical treatment had been applied with no avail, responded after six months' treatment with ultra violet radiation. The treatments were given semi-weekly for the first three months, which resulted in a fine, downy growth, and were then given weekly thereafter. Naturally the object in treating alopecia areata is to give marked stimulation.

Noting that the lamp in the initial treatment was as close as one foot for ten minutes, which was given for three consecutive treatments, naturally superficial burning is to be expected with marked reddening of the treated area. Bleb formation may even take place after the third or fourth treatment. If this occurs it is advisable to puncture the bleb at its base with a sterile needle, permitting a dry scab to form, and no further treatment should be given until exfoliation takes place. The treatments are then to be resumed as outlined, consequent blebbing usually not taking place.

In one case of alopecia areata of the temporal region of long duration rayings with the Alpine

Lamp were of no avail, so that the Kromayer Lamp was brought into use. The affected part was thoroughly cleansed with equal parts of alcohol and ether, the quartz crystal as well cleansed with a similar solution, applied directly to the lesion at right angles and securely strapped to the head. An exposure of twenty minutes under firm pressure was given. Consequent inflammatory reaction and blebbing followed. No further treatment was given for three weeks when a similar deep penetrative treatment was repeated. Superficial rayings were then resumed with the Alpine lamp twice weekly, and in twelve weeks a fine, downy growth presented itself, at first white in color, and which later on began to assume the natural color of the hair. In two months more there was a normal growth of hair.

ANGIOMA.

LAMP: Kromayer Lamp.

DISTANCE: Immediate approximation under firm pressure.

TIME: First treatment twenty to forty-five minutes, depending upon the presence or absence of interstitial connective tissue or pigment, and whether blonde or brunette.

FREQUENCY OF REPETITION: Three weeks.

The treatment of three types of angioma will be considered, namely, nævus vasculosus, also known as nævus flammeus; telangiectasis and angioma cavernosum.

The author has had experience in the treatment of all three of these conditions with the deep penetrative method under firm compression using the filtered ultra violet rays.

In the treatment of nævus vasculosus, the disfiguring so-called "mother's mark," the author feels that at last we have a method of procedure which will either entirely remove the obnoxious blemish or wonderfully improve the existing condition.

IN NÆVUS VASCULOSIS

we have two types to contend with—one which is quite flat, and the other somewhat elevated above the surface of the skin, their color varying from bright red to almost a violet tint, and are usually to be seen upon the face. The type which is quite flat and level with the surface of the skin responds more readily to treatment than the elevated type because in the latter form there is more or less connective tissue reticulum present, which interferes somewhat with the penetration of the rays.

In the former type if there is fading away of the color upon pressure by the finger, one or two twenty minute exposures should be sufficient without further repetition. However, if fading away does not take place, then a forty-five minute exposure should be given. The elevated type should receive at least forty-five minute exposures, it often being necessary to give three or four exposures at intervals of three weeks to the same area treated. It will be noted after the three weeks interval that a gradual fading away is taking place, and even after cessation of treatment continually slow and gradual fading is the rule.

Cleansing of the areas to be treated, also the lens and the quartz crystal with equal parts of alcohol and ether is to be carried out. Thorough and firm compression by strapping the lamp to the affected parts is to be practiced.

Intense inflammatory reaction with marked blebbing is usually the rule, and protection of the healthy skin is important. Within three or four hours after treatment there is a darkening of the area treated with some œdema, and upon close observation a darkened capillary network can be seen running through the nævus.

The swelling continues more or less for about

forty-eight hours when it gradually begins to subside. The treatment is ideal because there is no sensation experienced by the patient.

The operator must not forget that failure may be attributed to the fact that he has not kept his lamp clean and that carbon may form on the quartz which will interfere decidedly with the penetration of the rays.

It has been the author's habit to treat only one area at a time, as a forty minute sitting is sufficient for the patient. In future treatments the operator should be careful not to overlap the previous area treated. Careful outlining of the areas treated with adhesive plaster will obviate this.

Slight pigmentation of the skin may at times be noted after successive exposures. This, however, being extra-cellular, gradually disappears and the patient's fears in that respect should be quieted.

Next shall be considered the treatment of

TELANGIECTASES

which are the troublesome acquired new growths consisting of whirls of capillaries, usually being first noted in later life; found usually upon the face, neck, arms, or, in fact, upon any part

of the skin surface of the body, and at times are quite numerous. They consist of points or lines of tortuous capillaries which are usually bright to dark red in color, and are often a dominant factor in rosacea, particularly of the nose.

The technique for the treatment of telangiectasis is similar to that for the treatment of the elevated type of nævus vasculosus; that is, at least forty to forty-five minute exposures at repeated intervals of three weeks.

When rosacea is present, even of the hypertrophic type, it will be noted that there is a gradual lessening in the size of the area treated. In severe cases it may be necessary to give as many as six exposures; milder cases usually responding after two or three exposures.

The author has had but one case of

ANGIOMA CAVERNOSUM

to treat, in a child twelve years of age. The condition appeared shortly after birth and was made up of variously sized blood vessel cavities with free communication between them. There was a decided interstitial connective tissue framework throughout the growth. The lesion was quite elevated, lobulated and easily compressed. The color was of a decidedly purplish

hue, and was located in close proximity to the orbit.

In this case the result was not ideal; that is to say, there was not an entire obliteration of the nævus, due no doubt to the intense connective tissue framework. As many as six exposures were given to each area treated. The result, however, was a decided improvement with marked reduction in the size of the nævus with a marked fading out of the color. The patient was advised to return again in six months for further treatment with the hopes of being able to obliterate the nævus in its entirety.

ANGIONEUROTIC ŒDEMA.

See under Urticaria, page 160.

CALLOSITAS.

LAMP: Kromayer Lamp.

DISTANCE: Immediate approximation under firm pressure.

TIME: Thirty to forty-five minutes, depending upon the thickness of the callous area.

FREQUENCY OF REPETITION: Two to three weeks, if necessary.

The author has treated several cases of callositas all of which were of the painful type and located upon the soles of the feet. The lesions consisted of decidedly thickened, circumscribed patches of horny epidermis which were yellowish-white in color. One of the cases treated was associated with marked inflammatory changes and decided fissure formation.

Callositas usually being painful, the patient at first rebels because of the intense pressure which is necessary in order that the rays may penetrate deeply into the tissues; the thickened, cornified epidermis being a natural barrier to the penetration of the rays, decided pressure and long duration of exposure are, therefore, necessary. The pain, however, gradually subsides, due to pressure anæsthesia so that the patient soon reconciles himself to existing conditions.

Inflammatory reaction with consequent bleb formation about the outer margins of the areas treated resulted. The blebs were punctured and bunion shields were applied over the areas treated, which, however, were removed within four or five days.

In one case at the end of five days the entire area was loosened due to marked bleb formation and was easily removed in its entirety. I

antiseptic powders were applied and the area healed over in due course of time.

There has been no apparent return of the callositas in the cases treated. The cessation of pain immediately after treatment was gratifying to the patients. One case needed a second deep penetrative treatment, and the patient was perfectly willing to undergo the same because of the decided relief which he had experienced.

CHLOASMA.

LAMP: Kromayer Lamp.

DISTANCE: Immediate approximation under medium pressure.

TIME: Fifteen to thirty minutes.

FREQUENCY OF REPETITION: Two to three weeks if necessary.

Chloasma, or the so-called "liver spot," responds very favorably to penetrative treatments of the ultra violet rays under compression. Being a rather superficial pigmentary affection of the skin, it does not need as decided pressure as some of the foregoing conditions, nor does the time of exposure need to be as long. Fifteen to twenty minutes usually suffices, although where there is decided pigmentation thirty minutes may be necessary.

The cases of chloasma treated by the author were of a yellowish-brown tint, varying in size from a half dollar to quite large areas. The cases treated were due to systemic disorders and were of the symptomatic type,—one case being of the tubercular diathesis, and another associated with disturbance of the uterus. The reaction in both cases was decidedly mild, and in only one of the cases treated was there slight blebbing. All progressed favorably and in three weeks entire disappearance of the discoloration had taken place without apparent return.

DERMATITIS VENENATA.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of eighteen inches has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of fifteen minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then thrice weekly thereafter.

Dermatitis venenata, or that type of skin inflammation resulting from the influence of some

external irritant which may be either chemical, toxic or caustic, including irritants of various plants of the rhus and other species, lends itself admirably to treatment with ultra violet rays by the distance method.

These types of skin irritation usually present themselves as an erythema which soon becomes decidedly vesicular with a markedly red and at times œdematous base, and which is usually associated with marked stinging and burning.

The author feels that at last we have found something which is of decided benefit in the treatment of dermatitis venenata, particularly the so-called "ivy poison" type. The intense suffering which the patients have to undergo from the severe stinging and burning is usually immediately relieved after the first or second exposure to the ultra violet rays. They not only give immediate relief but seem to stop the progress of the disease, and it is advisable to treat the areas well beyond the affected portions.

During the spring and summer seasons of the past two years the author has treated a number of cases of dermatitis venenata with this method of procedure. In one particular case the body generally was affected. The patient's entire body was exposed to the rays, two lamps

being used in the treatment. Treatments for this type of acute dermatitis are naturally mild in comparison to the treatments necessary for the more chronic conditions. The patient's susceptibility to the action of the rays, therefore, must constantly be noted. In the interim between treatments cooling lotions were used. The usual duration of the disease with ultra violet radiations was markedly shortened, and patients who were susceptible to the disease, having had numerous previous attacks, were gratified with the ultra violet method of treatment.

ECZEMA.

LAMP: Alpine Sun Lamp.

DISTANCE: Acute Eczema—First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of two feet has been reached.

Chronic Eczema—First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of one foot has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: Acute Eczema—First treatment five minutes, increasing five minutes with each successive treatment until a maximum of fifteen minutes has been reached.

Chronic Eczema—First treatment five minutes, increasing five minutes with each successive treatment until a miximum of twenty to thirty minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

While not disputing the unsatisfactory results reported by various authorities, the author has had unusually good and uniform results in the treatment of eczemas, both of the acute and chronic type. The author has, however, at the same time, carried out the usual methods of local treatment combined with proper internal medication and dietetic regulations. The author has probably had better results in the treatment of this condition because he has routinely insisted upon raying the entire body, both front and back. While some patients objected to this procedure because they could not at first see the "sense of it," when results began to manifest themselves—something they had never experienced before in the treatment of their troublesome condition—they were perfectly satisfied after all that there was some sense in it.

Eczema being a dermatitis without definite entity and the result of some existing morbid

condition due to either internal or external influences or both, one can readily see the benefits to be obtained by a general raying of the entire body because of the beneficial systemic effects to be derived from such a procedure. It is a well known fact that the rays increase elimination, and, therefore, have very decided beneficial results in surface radiation, particularly in those diseases which are the result of existing morbid conditions.

To assist in elimination the author has always insisted upon the patient with eczema drinking copiously of distilled water, at least two or three quarts daily. Distilled water, because it is a soft water (having been robbed of all of its mineral properties in the process of distillation), acts admirably as a solvent of bodily toxines, stimulates the kidneys to healthy activity and helps the body, through its urinary and gastro-intestinal tracts, to get rid of its many poisonous toxines.

Chronic Eczema.—Naturally in the more chronic types of eczema, particularly the so-called clinical type of eczema rubrum, which is the result of secondary changes in which there is a decidedly inflamed, weeping surface which is reddish and excoriated, there is, of course, intense exudation of serum which may be asso-

ciated with sanguineous exudate, at times forming decided crusts which may remain or become loosened by the profuse underlying secretion.

Infiltration and thickening is always associated with this type of eczema. Where there has been marked crusting, these crusts should, of course, be removed by first applying liberal applications of olive oil. It is useless to try to ray the parts with the crusts remaining because the rays will not penetrate.

These types of eczema naturally demand more strenuous treatment than the acute types.

In the rather rare types of eczema verrucosum and sclerosum marked stimulation, of course, is necessary with the hopes of producing sufficient inflammatory reaction to carry away the diseased cellular structure. The author has treated these cases of hard, indurated, verrucose eczema with admirable results by using the deep penetrative method with the Kromayer Lamp, the selected quartz crystal being put in close approximation to the diseased area under decided pressure for from twenty to thirty minutes until the entire area has been treated. Subsequent superficial rayings by the distant method were then carried on with the Alpine Lamp and treated as ordinary acute eczema with decidedly good results.

ERYSIPELAS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatments until a maximum distance of eighteen inches has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a minimum of fifteen minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments, and then twice weekly thereafter.

The wonderful bactericidal effects of the ultra violet rays have been mentioned from time to time, and this is truly so in the treatment of erysipelas. The annihilation of the streptococcus of Fehleisen seems to be more quickly produced in the treatment of erysipelas by ultra violet radiations than by any other method known to medical science; at least, such has been the author's experience, and he has tried them all. Here again surface radiations of the entire body have been practiced with decided beneficial results to the patient. This cannot be usually carried out as an office routine,

but can be admirably practiced in hospitals at the patient's bedside.

The earlier the erysipelatous infection is recognized the prompter is the response to treatment by ultra violet radiations. It is quite difficult at times for the dermatologist or even the general practitioner to recognize erysipelas at its very onset. Dermatitis venenata in the erythematous stage and eczema erythematosum, particularly when these two conditions appear upon the face, are the two very close conjurors of erysipelas.

The author routinely carried out the local application of saturated solution of magnesium sulphate upon the infected areas.

Experience has certainly demonstrated that with the assistance of ultra violet radiations the duration of the attacks have been markedly shortened and the patient's relief from pain and temperature have been decidedly influenced for the better.

ERYTHEMA MULTIFORME.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of two feet has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of fifteen minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

In the treatment of erythema multiforme we have to consider the presence of an angioneurosis as well as an auto-intestinal intoxication. Here surely surface radiation of the entire body as well as the affected parts is of decided benefit to the patient. The disease is, of course, an acute inflammatory and exudative one, appearing with all types of lesions which may be either discrete or aggregated in patches of various size and shape, one type, however, usually prodominating.

Some patients treated by the author with ultra violet radiations with the distant method had mild constitutional disturbance as well as rheumatic pains. In some the subjective symptoms were absent, while in others there was quite severe itching. Purpura (Schoenlein's disease) was associated with one case and urticaria with another, and in another case, quite recently treated, the mucous membranes of the mouth were involved. There was marked crusting and blebbing of the lips, and the patient suffered intolerably, being only able to partake of liquid

foods. It was gratifying to note how quickly the rheumatic pain subsided after surface radiation, and how soon the intense and intolerable itching was removed.

In the case of erythema multiforme which had attacked the mucous membranes of the mouth the Kromayer Lamp was used, the rays being directed to the mucous membranes by the use of the quartz rod. The patient responded quickly, the pain subsided, and, in the course of ten days, involution began to take place. In the course of four weeks the patient's lesions had entirely healed. Antiseptic and astringent mouth washes were used in conjunction with the radiations, and mild soothing lotions were used upon the skin lesions during the intervals between treatments.

ERYTHEMA PERNIO (Chilblain).

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of two feet has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of twenty minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

The unusually severe winter of 1917 and 1918 has given the author plenty of opportunity to demonstrate the efficacy of ultra violet radiations in the treatment of erythema pernio or frost bite. He has entirely satisfied his mind that frost bite will readily succumb to the influence of ultra violet radiations. Three to six treatments have usually been sufficient to bring about a relief from the existing condition. During the interval between treatments the affected areas were lightly bandaged after applying the unguentum bismuth subnitratus. The patient usually experienced decided relief from the annoying stinging and burning after the second radiation.

FOLLICULITIS DECALVANS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of one foot has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of thirty minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

The author has had to treat but one case of folliculitis decalvans and that successfully, although he had almost given up in despair, and which was entirely due to the fact that he was not strenuous enough in his treatment. Folliculitis decalvans demands heroic treatment, at least it did in the case under consideration.

The patient in question had a type of inflammation which involved the hair follicles and adjacent tissues, with consequent destruction of the hair papillæ and resultant baldness. The disease began as small, red papules, which later on became pustular, situated about the hair follicles, the center of which were pierced by the hair shafts. The established alopecia, of course, was permanent. Here and there resultant scars were to be seen.

Previous to beginning treatment the pustules were carefully opened and evacuated. Decided blistering was resorted to, the blebs being carefully opened and the serum contents gently removed without destroying the covering. Consequent scab formation took place which was allowed to shed of its own accord with consequent healing beneath it. The hair in the affected areas

which had not already been destroyed by the folliculitis process remained both to the gratification of the patient and the author. Eight weeks were consumed in bringing about a cure. Up to the present time no new lesions have manifested themselves.

FURUNCULOSIS.

LAMP: Kromayer Lamp.

DISTANCE: Immediate approximation under firm pressure.

TIME: Twenty to thirty minutes.

FREQUENCY OF REPETITION: Usually not necessary.

Furunculosis, if seen early, before suppuration has set in, can easily be aborted with an intensive compression treatment with the Kromayer Lamp.

One treatment is usually all that is necessary; pain is more or less severe during the early parts of the treatment, but gradually subsides from pressure anæsthesia before the exposure has been completed.

Further pain is usually not the rule, retrogression of the infective process starting in immediately after the inflammatory reaction of the light treatment begins to subside.

The healing process of fununcles which have already undergone suppuration may be easily hastened by surface radiations with either the Kromayer or Alpine Sun Lamps.

HERPES ZOSTER.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of two feet has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of fifteen minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

Grateful indeed is the patient who can get relief from the intense neuralgic pains associated with herpes zoster. The author has satisfied his mind upon the efficacy of ultra violet radiations by the distant method in the treatment of herpes zoster or shingles.

The author has treated six cases of obstinate types of herpes zoster, one of which was associated with secondary pus infection and consequent ulceration. One case was associated with hæmorrhagic change in the vesicles which involved the entire right side of the face and head; the pain along the cervical nerves being intense. During the interval between treatments calamine lotion (see author's "Elementary Dermatology") with one-half per cent. of phenol was applied, the intense drying qualities of calamine lotion being well known.

In one case the author feels that he aborted an attack of herpes zoster in a patient who was subject to frequent attacks, which were always preceded by intense neuralgic pains along the cervical and brachial nerves. The erythematous spots had already presented themselves, at which time ultra violet radiations were begun. By the end of the week minute vesicles in groups had made their appearance. Here the progress of the cutaneous manifestations ceased to the great delight of the patient. Pain had stopped after the second radiation, and in another week the minute vesicles had retrograded and an otherwise severe attack of herpes was aborted.

This patient was subject to two or three at-

tacks a year which always went on to ulceration and lasted from two to three months before it was entirely healed.

ICHTHYOSIS (Fish Skin Disease).

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of eighteen inches has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatmtnt five minutes, increasing five minutes with each successive treatment until a maximum of thirty or forty-five minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

The author's experience with ultra violet radiations in the treatment of ichthyosis has been limited to two cases. One of ichthyosis simplex was in a girl fourteen years of age which had existed since birth and which was limited to the posterior aspects of the lower limbs, associated with much dryness of the skin and slight scali-

ness of the entire body. There was, however, marked furrowing in the bends of the knees which was associated with thick scales which had assumed a brownish or greenish tint (ichthyosis nigricans).

This patient was decidedly improved during hot weather when there was free perspiration.

The other was a case of ichthyosis histrix which is rather rare. In this patient there was marked papillary and cutaneous hypertrophy associated here and there with warty or horny patches, particularly in the arm-pits, and in the bends of the elbows and knees. The rest of the entire body was associated with marked dryness of the skin with intense scaliness. Here and there where the scales were absent the skin had the characteristic appearance of fish skin.

This patient had tried all sorts of treatments without avail. Had been treated in the various clinics abroad, and had as well had a year's treatment with the Finsen light in one of the clinics in Vienna with only slight relief.

This patient has been under the author's care for a year and a half. She is so wonderfully improved that she has taken a new lease on life and her gratitude knows no bounds.

In both cases the entire body was subjected to

distance radiations, even to the extent of severe "burnings" with bleb formations. At first results were rather negative, but upon accidentally "burning" the patient, due to the accumulative effects of the rays, a marked improvement was noted.

The patient immediately insisted upon frequent "burnings," as she felt that they were decidedly beneficial to her, and in that she was quite correct, so that the author did not hesitate to gratify her desires in that respect.

Marked pigmentation has resulted in this patient so that her skin is now a dark color. She hopes that she will remain that way as she is gratified with her darkened complexion. The author was sorry to have to inform her that in that respect her wishes could not be gratified because the pigment being extra-cellular will gradually disappear as the treatments are ceased.

The skin of this patient now is soft and pliable, the warty overgrowths have been entirely removed and the thickened furrows have decreased. Constant exfoliation is going on due to the action of the rays. Olive oil emulsion (see author's "Elementary Dermatology") is thoroughly massaged into the skin night and morning.

KELOID.

LAMP: Kromayer Lamp.

DISTANCE: Immediate approximation under firm pressure.

TIME: First treatment twenty to forty-five minutes, depending upon the thickness of the growth.

FREQUENCY OF REPETITION: Two to three weeks.

Keloid, both of the true and false type, has been successfully treated by the author with the deep penetrative method with the Kromayer Lamp. So far there has been no apparent return of the lesion—one case having been treated two years ago.

Some eight years ago, when the author first began his investigations with solidified carbon dioxide in the treatment of cutaneous neoplasms, he thought that he had found the remedy par excellent in the treatment of keloids, but time has proven that in that he was mistaken as the keloids he treated at that time, true to their nature, returned just the same as ever, some in a short duration of time and others even after several years. It is to be hoped that the treatment of keloids by the compression method with ultra violet rays will show better and more permanent results than

with the previous method of treatment. Sufficient time has hardly elasped to make certain whether the results are permanent or only transient.

The author has had to treat four cases of keloid,—three of the true type and one of the false type. The first case of true keloid was upon the breast of a woman aged forty years, which was quite elevated, irregular in outline, at least three inches in breadth and six inches in length. The growth was quite hard, the surface was irregular, of a pale, pinkish color and the patient complained of considerable pain.

Three different exposures were given to this case over the entire area, taking one portion at a time and being careful not to overlap the treated areas. Forty-five minutes were given to each exposure with intensely firm pressure during which the patient was strapped to the apparatus.

Several of the treatments were followed by sloughing, but all in all the end results were good. Treatments were not repeated oftener than once in three weeks upon any separate area.

This case was treated two years ago, and so far has shown no apparent tendency to return. There was intense inflammatory reaction in this case, as well as in the three other cases treated, and there was as well marked bleb formation.

The case of false keloid was upon the nape of the neck of a negro which had followed a razor cut. This type seemed to respond more rapidly to the deep penetrative method of treatment than the true type of keloid.

KERATOSIS PILARIS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of eighteen inches has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of fifteen minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

Keratosis pilaris responds very promptly to surface radiations with the Alpine Sun Lamp. The author has treated several cases with very rapid improvement.

These cases presented themselves with hypertrophic affections about the mouths of the hair follicles which showed pin-head sized, epidermic accumulations located on the extensor surfaces

of the arms, but mostly upon the thighs. Curled hairs were found within the lesions. The skin was unusually rough. The lesions were grayish in color and consisted of accumulated sebum and epidermal cells; were decidedly worse during the winter and always better in the summer.

Keratosis pilaris responded usually within two weeks. Mild reactions were the rule with slight exfoliation of the epidermis.

LICHEN PLANUS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of one foot has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of thirty minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

Two cases of lichen planus of the chronic type have been successfully treated by the author with

the surface method of radiation by the use of the Alpine Lamp. Rather strenuous treatment was given in both cases even to the extent of blistering the skin, which was followed by marked desquamation. Treatment for three months was necessary in one case and for two months in the other case.

Both cases were of the inflammatory type, consisting of pin-head to pea size, flattened, angular, violaceous, shining papules with marked tendency to coalesce into the formation of patches. Some of the papules showed marked umbilication and were at times surmounted with fine scales. There was a dark brown pigmentation in the one case, the pigmentation entirely clearing up with the cessation of the disease.

One case was upon the flexor surfaces of both forearms, extending down to the wrists; and in the other case the lower limbs only were attacked. One case as well had lesions in the mucous membrane of the mouth which appeared as whitish spots. In this case the Kromayer Lamp was used with the quartz rod, directing the rays into the mucous surface of the buccal cavity for twenty minute exposures.

The author also had one case of lichen hypertrophicus to treat in which the lichen papules

were associated with brownish, warty elevations. In this case the Kromayer Lamp was resorted to with deep penetrations under firm pressure; treatments lasting for thirty minutes.

Several treatments were necessary for each area. Four months' time was required to bring about an eradication of the trouble. All sorts of treatment had been previously tried, both by the author and others, without apparent results. Inunctions of the author's olive oil emulsion (see author's "Elementary Dermatology") were applied during intervals between treatments.

LICHEN URTICATUS.

See under Urticaria, page 160.

LUPUS ERYTHEMATOSUS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment two feet, gradually decreasing six inches with each successive treatment until a minimum of one foot has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of thirty to forty-five minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

In the author's book on "Solidified Carbon Dioxide in the Successful Treatment of Cutaneous Neoplasms and Other Skin Diseases," published in 1912, he lays great stress upon the efficacy of "refrigeration" in the treatment of lupus erythematosus. Therein the author states: "Surely in carbon-dioxide it has been more than demonstrated that we have in the treatment of lupus erythematosus a method of procedure which is decidedly quick in its results with comparatively inconspicuous scars, if indeed they may be called scars."

The author at this time is still of the opinion that carbon-dioxide is an ideal agent in the treatment of the condition under consideration. It has certain advantages and disadvantages over the treatment by ultra violet radiations. In the first place, treatment by the refrigeration method is decidedly painful; reactions are intensely violent with marked scab formation which the patient has to carry for a considerable period of time. Small areas at a time only can be treated. The end-results, however, are good.

The advantages to be gained in the treatment

of lupus erythematosus by the surface radiation method, which the author prefers, are that the procedure is painless, the entire area affected can be treated at one single exposure; there is milder reaction and no scab formations. The duration of time, however, is longer with the ultra violet radiations.

The patients uniformly prefer the surface radiation method of treatment for reasons already given and which are quite apparent.

From the reports of literature upon the subject certain it is that lupus erythematosus succumbs very readily to the ultra violet method of treatment, some authors preferring the deep penetrative method and others the surface radiation method. Both are effective.

Strenuous treatment is absolutely necessary and must be the keynote in the treatment of this type of cutaneous affection. The more often the patient is blistered the better are the results. Mild treatments are of no avail and are simply a waste of good time.

The author's method has been to give such strenuous treatments only once in six weeks, and lighter treatments just short of "burning" during the interim. The author's calamine lotion (see author's "Elementary Dermatology") is used in

between treatments, and being of a delightful pink tint, the patients are very eager for its use, for it very nicely assists in hiding the disease as well as the results of treatment.

The author has several widespread cases of lupus erythemotosus at present which he has been treating for over a year by the surface method. The results are really wonderful. In mild cases the usual time seems to be about six months for eradication.

The cases of lupus treated were characterized by slightly raised patches which were irregular and well-defined, mostly upon the face, some few associated with lesions upon the scalp—adherent yellowish scales which dipped down into the fol licular orifices were present. In all cases, except those which were quite superficial, there was more or less infiltration, the color varying from bright red to violaceous.

The majority of these cases had made the rounds and were sent to the author as the "graveyard"' as is frequently the rule with the dermatologist. Most of these cases had all sorts of topical treatments including radium, dessication with high frequency currents, x-rays, and all types of local applications ranging from the severest to the mildest.

One particular factor in favor of the surface method of treatment for this disease is the absolute lack of scarring. The areas treated with carbon-dioxide are usually intensely white and make a marked contrast with the surrounding skin, which is not so with surface radiation methods.

LUPUS VULGARIS.

See Tuberculosis Cutis, page 154.

NÆVUS PIGMENTOSUS, NÆVUS SPILOSUS, NÆVUS VERRUCOSUS, NÆVUS PILOSUS, NÆVUS LIPOMATODES.

LAMP: Kromayer Lamp.

DISTANCE: Immediate approximation under firm pressure.

TIME: First treatment twenty to forty-five minutes, depending upon the amount of pigment present and the presence or absence of connective or adipose tissue.

FREQUENCY OF REPETITION: Two to three weeks.

The various types of nævi are amenable to treatment with the compression method by use of the Kromayer Lamp. Some types of nævi are particularly resistant to treatment, and as many

as three or four exposures are necessary for their ultimate removal.

The Kromayer Lamp, however, seems to have no influence upon the profuse hair growth usually associated with the pilosus type as they seem to grow on just as merrily as ever.

The ordinary type of nævus pigmentosus usually demands a twenty minute exposure under firm pressure. This type of nævi is usually not elevated but on a level with the skin. However, in some cases slight elevation is noted, the size varying from quite small points to even very large areas, at times larger than the palm of the hand.

In treating these large areas the operator should be careful not to overlap the previous areas treated. If the pigmentation is intense, as much as three and four exposures to the one area may often be necessary at intervals of two or three weeks, depending entirely upon the time necessary for complete reaction.

The author cannot quite see the fear of causing the production of more pigment because the pigmentary deposit is extra-cellular, and, therefore, naturally disappears. The author's experience has been that the areas around the lesions treated are usually slightly pigmented after treatment

rather than the area itself. In all cases, however, this extra-cellular pigment has gradually disappeared.

NÆVUS PILOSUS.

This is the ordinary pigment mole which is associated with a growth of hair from the lanugo light hairs to even stiff, bristle-like hairs in marked quantities. Elevation above the surface of the skin is usually the rule in this type, and, therefore, naturally demands somewhat more persistent treatment than the non-hairy type.

Exposure should be about thirty minutes' duration, and, as with the previous type, frequency of repetition is necessary. Hairs persist after the treatment.

NÆVUS VERRUCOSUS.

The verrucose type of nævi is associated with a wart-like overgrowth due to papillary hypertrophy. At times there is deep fissure formation; the nævi varying in size from that of a bean up to several inches in circumference.

This type again demands even more strenuous exposures and pressure than the previous type. Thirty to forty minutes is about the right time.

The author had one case in which superficial sloughing took place, which, however, went on to an uneventful recovery without apparent scarring. The unguentum bismuth subnitratus (see author's "Elementary Dermatology") was applied between treatments.

NÆVUS LIPOMATODES.

This type of nævus is more resistant to ultra violet radiations under the compression method than either of the preceding types because of the associated connective and adipose tissue, often forming soft, tumor-like overgrowths.

Here the treatment should be at least forty five minutes with very firm pressure. This type of nævus is not very widespread so that usually an entire area can be covered with one exposure; three and four exposures often being necessary to produce eradication.

PAGET'S DISEASE.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of one foot has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of thirty minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

The author has had to treat but two cases of Paget's disease of the nipple, one of which responded admirably to the treatment after six months' duration.

The one case in question had been under the author's care for a previous year and a half without apparent benefit. The rays were then applied with the hope that they might possibly do some good. The trial was not without benefit.

When the case first presented itself it had the appearance of an ordinary eczema on one side of the breast, being about three inches in circumference. The woman was fifty years of age.

The disease began as a scaly area about the nipple which gradually became moist with much serum exudate and was covered with superficial crusting. More or less infiltration later on appeared, the nipple gradually retracting.

The author's first intention was to use the Kromayer Lamp. This was tried and was found to be impossible because of the flabbiness of the

mammæ as no firm or decided pressure could be applied.

The treatments with surface radiations were very mild at first, beginning at a distance of three feet, gradually decreasing six inches until a minimum distance of one foot was reached. The exposures were gradually increased in time until a maximum of thirty-five minutes was reached, increasing five minutes with each treatment.

Consequent "burning" followed with increased exudate of serum and much exfoliation. During the stages of active reaction the lamp was receded to the original distance of treatment, namely, three feet, and gradually increased again to a distance of two feet and left in this position until entire reaction took place from the previous "burning."

An interval of three full weeks was allowed with mild surface radiations before another "burning" was attempted.

Strenuous treatment was, therefore, necessary in this case, which responded admirably after six weeks' application of the rays. During the interval between treatments a three per cent. Fuchsin ointment was applied.

The other case failed to respond to treatment, and so sought relief from the surgeon.

PITYRIASIS ROSEA.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of two feet has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of fifteen to twenty minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

The author has treated several cases of pityriasis rosea with the surface radiation method with the use of the Alpine Lamp, and is thoroughly satisfied that the light has shortened the duration of the disease.

All three types were of a mildly inflammatory nature, consisting of roundish or ovoid lesions of salmon color. Some of the lesions were discrete and others confluent; some patches reaching the size of a dollar.

All three cases had the usual onset with the so-called "mother spot," which in a few days was followed with a general eruption, limiting itself to the trunk.

The itching was ameliorated immediately after the first treatment, and three to four exposures were all that were necessary to bring about a complete normal condition of the affected parts of the body.

POWDER STAINS AND TATTOO MARKS.

LAMP: Kromayer Lamp.

DISTANCE: Immediate approximation under firm pressure.

TIME: First treatment thirty to forty-five minutes, depending upon the amount of stain or pigment present, and whether blonde or brunette.

FREQUENCY OF REPETITION: Three weeks.

The author has had but one case each of powder stain and tattoo mark to treat, and cannot say that his results were entirely satisfactory. They were, however, much improved.

Both cases were very severe ones, and no doubt the results attained were as much as could be expected. The stains and marks were certainly made less conspicuous than they were previous to the treatment.

In both cases the end result was a blurred, white, bluish color of the skin, which was quite satisfactory to the patients.

Severe treatments were given with very firm pressure. Marked reaction with bleb formation followed in each case. As many as six exposures were given to each area. No doubt the milder and more superficial types will respond more admirably to this method of treatment.

PRURITUS SENILIS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of eighteen inches has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of twenty minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly, if necessary.

The author has had uniformly good results in the treatment of pruritus of every type. Particularly gratifying have the results been in the treatment of generalized pruritus senilis with its consequent atrophic changes in the skin.

Mild treatments have been the rule, it not often being necessary to give more than six exposures.

Pruritus vulvæ, pruritus ani, pruritus senilis, pruritus hiemalis, and the various types of pruritus universalis found in the neurotic and those suffering with diabetes and jaundice have come under the author's care for treatment with the surface method of radiation with the Alpine Lamp.

Pruritus hiemalis, or winter pruritus, usually resulting from atmospheric influence, generally worse before retiring, after undressing, and "bath" pruritus in which the patients are wont to suffer with intense itching following bathing, have responded very quickly to surface radiations, it not being necessary to have to give more than three exposures in both of the aforesaid types.

Senile pruritus, the pruritus which annoys the aged so intensely, readily succumbs to surface radiations, the entire body being rayed, both front and back. Six treatments usually have sufficed to bring about a relief of this condition.

During the interim of treatments the author has advised the use of thorough inunctions of the entire body with olive oil emulsion (see author's "Elementary Dermatology").

Pruritus vulvæ and pruritus ani have both responded admirably to surface radiations;—one

particular case of very severe pruritis ani in a physician, in which "everything under the sun" had been tried, as he put it, even to severe applications of silver nitrate solutions, and all without apparent relief.

The first treatment gave almost immediate results so that the physician's joy knew no bounds. Six exposures eliminated the entire condition, and he has had no return within a year.

The pruritus universalis, secondary to systemic disease, usually responds within six treatments. In this type of pruritus it may be necessary to give occasional treatment during long intervals, particularly in the more chronic diseases.

PSORIASIS, PARA-PSORIASIS, SEBORRHŒIC PSORIASIS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of one foot has been reached.

TIME: First treatment ten minutes, increasing five minutes with each successive treatment until a maximum of thirty to forty-five minutes has been reached, depending upon the intensity of the disease.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

Psoriasis, the "bug-bear" of the dermatologist and the general practitioner as well, remains just as much of a "bug-bear" as ever. True it is that certain types of psoriasis will respond very quickly and even permanently to surface treatment wth the ultra violet radiations.

When the author first undertook the treatment of psoriasis with this method of procedure he no doubt had the same experience as all other dermatologists who have used ultra violet radiations, and that was extreme gratification with the rapidity with which the lesions disappeared. But, alas, he also has felt the same disappointment as others because of the rapidity with which the lesions in some cases reappeared.

The author has had many cases of psoriasis to treat. The family physician, when at his wits' end and the patient thoroughly disgusted, sends his cases of psoriasis to the dermatologist so that he may "worry with them."

The author, however, feels thoroughly satisfied that when the psoriasis lesions do return they disappear much more rapidly under continued ultra violet radiations than with any other known

method. Each subsequent group disappear still more rapidly under subsequent radiations. The patient prefers this method of treatment, which is pleasant and unaccompanied by the inconveniences of having to apply the usual local applications.

It is peculiar that some cases of psoriasis should absolutely disappear and not return for at least three years, which happened in one particular case with which the author is familiar.

It is further peculiar that the author has treated psoriasis in two members of the same family; in one youth sixteen years of age, in which the psoriasis was in its beginning, consisting of coin-sized lesions well distributed over the body; and in his brother, twenty-four years of age, who had very large, thick placques of psoriasis distributed over the entire body including the face and scalp.

The younger brother's lesions disappeared within six consecutive treatments, and have not reappeared. The elder brother's lesions began to fade away after the third treatment, and entirely disappeared after the twelfth radiation. Inside of six months his entire crop returned worse than ever. Treatments were begun anew with a rather more rapid disappearance than after the

first treatments, and reappeared again within the usual six months. He became so thoroughly disgusted that he failed to return for subsequent treatment.

During the interim of treatments in the severe cases of psoriasis the author has directed the use of the olive oil emulsion, containing ten grains of salicylic acid to the ounce (see author's "Elementary Dermatology"), which was thoroughly massaged into the skin at bedtime.

The treatments in psoriasis have to necessarily be very strenuous. "Burning" after "burning" with consequent blistering has been quite necessary in the more severe types. Naturally pigmentation has resulted, which, however, being extracellular, disappears in due course of time.

The author has never ceased radiations during the time of reaction following "burnings," but has given milder treatments.

Marked desquamation of the skin takes place with the ultra violet radiations. No contrast, however, to the perfect showers of scales which are seen when the patients remove their underwear previous to treatment.

To get the best results it is quite necessary when the scales are particularly heavy and im-

bricated to have them removed previous to beginning radiation treatment. Some operators have failed to do this and their results have consequently been more or less negative.

The applications of olive oil emulsion at bedtime assist admirably in the removal of such scales and at the same time soothe the skin from the intense irritation of the rays, the patient being directed to thoroughly cleanse the body on the morning previous to treatment with a bran water bath.

In the very severe and resistant placques which do not succumb readily to the surface radiations, they may be made to disappear by deep penetrative treatments with the use of the Kromayer Lamp, giving exposures from twenty to thirty minutes with firm pressure.

When itching has been present it has disappeared after one or two exposures with the surface radiation. The usual internal medication and dietary regulations has been as well carried out in the treatment of these cases of psoriasis.

All in all, ultra violet radiations are of decided benefit in the treatment of psoriasis, and are a decided asset to the dermatologist's armamentarium in combating this type of disease.

PARA PSORIASIS.

Heretofore para psoriasis (dermatitis psoriasiformis nodularis) has been considered resistant to treatment. Practically no type of internal medication and local treatment, even including the x-rays, seems to have had any beneficial influence upon this form of skin eruption.

The author has had two cases of para psoriasis come under his care, both of which were successfully treated with surface radiations with the use of the Alpine Lamp.

The first case resembled in some degree true psoriasis, being characterized by small, brownish-red, flat papules which were somewhat scaly and spread over the entire trunk, including the extremities.

The second type bore a resemblance to lichen which formed irregular patches consisting of small papules of a yellowish-red color which were slightly scaly.

The entire body was more or less covered with this type of eruption which was retiform in its appearance. The skin was thickened and some areas had the peculiar violaceous coloring to be seen in lichen.

In both cases, which were in adult males, there

was a marked absence of itching. One case was of two years' duration, and the other case of three and one-half years' duration.

Mild treatments are of no avail in this condition. Experience has demonstrated that it is necesssary to give very strenuous applications of the rays. Initial treatments were begun at three feet and then gradually decreased six inches with each successive treatment until a minimum distance of one foot was reached.

The first treatment was ten minutes, increasing five minutes with each successive treatment until a maximum of thirty minutes in one case and forty-five minutes in the other case had been reached.

Naturally severe reactions resulted with marked "burning" and at times blistering and consequent exfoliation of the epidermis.

Six consecutive treatments were necessary in the first case before any apparent influence of the rays was seen upon the disease. Radiations twice a week then were followed out with the lamp as close as one foot to the skin surface.

Two lamps were used in giving the treatments in both of these cases to the anterior and posterior surfaces. One case responded after three months' treatment, and the second case after four

months' treatment. There has been no apparent return in either case after a lapse of one and one-half years, respectively.

SEBORRHŒIC PSORIASIS.

There is one type of psoriasis at least in which ultra violet radiations are one hundred per cent. efficient and that is in the seborrhœic form; in other words, that variety of psoriasis in which the seborrhœic element predominates.

This type of psoriasis is not unlike true psoriasis except that the scales are not as thick and heavy and imbricated, and are not of the usual pearly white color. Instead, the scales are thinner and are of a dirty, greasy nature.

The sites of predilection are on the chest and back. The disease, like true psoriasis, is progressive and decidedly chronic. This type of psoriasis does not usually attack the elbows and the knees. The face and scalp, however, are often affected.

The author has had to treat quite a number of cases of psoriasis in which the seborrhœic element has predominated over that of true psoriasis. The results have been very prompt and satisfactory, not more than six to eight radiations being

necessary to clean up quite large areas of this form of psoriasis.

In cases of the mixed type the seborrhœic form has always responded very rapidly, leaving the true psoriasis lesions in their wake. The more the seborrhœic element enters into the psoriasis the easier it is eradicated.

Exposures were mild in comparison to those given in the treatment of true psoriasis, and "burning" has never been necessary. It has been most gratifying that there has been no apparent return.

ROSACEA.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum of eighteen inches has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of twenty minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

The treatment of rosacea, either alone or associated with acne and seborrhœa as it usually is, is the same as for acne. (See Acne, page 82.)

Rosacea, being of three stages—the hyperæmic, the telangiectetic and the hypertrophic.

Rosacea, particularly of the nose, when associated with telangiectases, will not succumb to surface radiations alone, nor will the hypertrophic type. The hyperæmic type is easily influenced by mild surface radiations, whereas the telangiectetic and hypertrophic stages demand deep penetrative treatments by use of the Kromayer Lamp under firm pressure, the exposures varying from twenty to forty minutes, depending upon the amount of tissue hypertrophy; the treatments being repeated once in two or three weeks, depending upon the amount of time necessary for complete reaction. Mild surface radiations are given in the interim twice weekly.

Marked desquamation is usually the rule, and there is a general subsidence of the engorged capillaries as well as a gradual reduction of the enlargement.

SCARS.

LAMP: Kromayer Lamp.

DISTANCE: Immediate approximation under firm pressure.

TIME: First treatment twenty minutes to forty-five minutes, depending upon the thickness of the scar tissue.

FREQUENCY OF REPETITION: Two to three weeks, depending upon the amount of time necessary for complete reaction.

The author has had a number of cases of scar tissue to treat, including several of the exuberant type. Where the scar tissue was not very thick, ideal cosmetic results were obtained. In others the thickened scar tissue was decidedly reduced and the appearance greatly improved.

As many as three and four exposures were necessary for each individual area treated. For detailed technique see under Keloid, page 117.

SCROFULODERMA.

See Tuberculosis Cutis, page 154.

SEBORRHŒA.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of two feet has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of twenty minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

Seborrhœa simplex, or oily skin, which is so annoying to so many of the fair sex, can easily be controlled by surface radiations with the Alpine Lamp.

Mild radiations only are necessary, the disease usually succumbing to the influence of the rays after from four to six treatments.

Puberty is the age at which seborrhœa oleosa has its beginning, and it behooves the physician at this time to combat the existing seborrhœa as well as comedo formation, which is usually coexistent with it, if he would prevent the troublesome acne lesions which follow.

The women particularly prefer the ultra violet radiation method of treatment for this troublesome condition to using greasy salves or even lotions.

Naturally exfoliation takes place after the rayings and with it myriads of microbacilli of seborrhœa and the bottle bacilli of Unna, which are the causal factors.

SEBORRHŒIC DERMATITIS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of one foot has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of thirty minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

In seborrhœic dermatitis excellent results are obtained by this surface method of radiation with the use of the Alpine Lamp. Rather more strenuous treatments are necessary than for the simple type of seborrhœa.

The author has treated many cases of seborrhœic dermatitis even in which wide-spread areas of the body generally have been involved. There never has been a case which did not respond immediately to this method of treatment.

"Burning" has not always been necessary, but in many cases where the placques have been markedly associated with the papular form of seborrhœic dermatitis, this method of procedure nas been followed.

It is very important that the operator make absolutely sure of his diagnosis of seborrhœic dermatitis. One is so apt to confound seborrhœic dermatitis with eczema. The type of treatment necessary for seborrhœic dermatitis would necessarily be entirely too strenuous for that of eczema and would do it more harm than good.

If the operator will bear in mind that seborrhœic dermatitis has its sites of predilection usually upon the chest and back, in the arm-pits and about the crural regions, commissures of the nose and on the scalp, and that seborrhœic dermatitis is a mildly itching disease and only worse when warm or overheated; whereas eczema is a decidedly itching skin disease and itches constantly. It is a protean disease, and oozes serum constantly, whereas seborrhœic dermatitis never changes its character, and if it oozes at all, the nature of the exudate is oily. Again, in seborrhœic dermatitis there is marked scale formation which is bran-like in character and is greasy.

SYCOSIS VULGARIS.

See Tinea Sycosis, page 151.

TELANGIECTASIS.

See under Angioma, page 94.

TATTOO MARKS.

See under Powder Stains, page 133.

TINEA TRICHOPHYTINA, TINEA CIRCINATA, TINEA SYCOSIS, TINEA TONSURANS, TINEA CRURIS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment two feet, decreasing six inches with each successive treatment until a minimum distance of one foot has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of thirty minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

The trichophyton fungus yields readily to the influence of ultra violet radiations whether upon

the scalp or bearded region, the body generally, or in the crural regions.

Strenuous treatments are necessary even unto "burning" with consequent bleb and superficial scab formation. In the very deep types of tinea tonsurans, or ringworm of the scalp, where it has been found applicable, the author has used the compression method of treatment with the Kromayer Lamp for exposures of twenty to thirty minutes. One and occasionally two radiations have been necessary at intervals of two or three weeks, depending upon the time necessary for complete reaction.

This holds good also for the deep nodular type of tinea sycosis, or ringworm of the bearded region. Superficial types of tinea sycosis have responded readily to surface radiations.

Sycosis vulgaris, the non-parasitic type of sycosis; in other words, the pyogenic infection of the hair follicles usually by the staphylococcus, responds even more readily to surface radiations than the true type of sycosis. Depilation may be practiced in both types of sycosis, but the author has not always found it necessary as a routine measure.

Tinea circinata, or ringworm of the body, as well as tinea cruris, or ringworm of the genito-

crural region, respond admirably to surface radiations. As previously stated, marked "burning" should be the rule.

It is advisable in treating both of these types of trichophyton fungus infection to protect the healthy skin about the lesions. In tinea cruris it is important that the operator should differentiate this disease from the so-called eczema marginatum, because, as stated under seborrhœic dermatitis, eczemas will not tolerate the strenuous treatments necessary for the annihilation of the trichophyton fungus.

Unfortunately, both eczema and tinea cruris are intensely itching in this region, which is not the rule of trichophyton fungus infection elsewhere.

If the operator will bear in mind that tinea cruris usually has a more or less clear center and is definitely outlined on the margins, it will assist him a great deal in differential diagnosis. In eczema the patches are usually conglomerated, and there are evidences of eczema elsewhere.

TINEA VERSICOLOR.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treat-

ment until a minimum distance of two feet has been reached. Patient's susceptibility to be constantly borne in mind.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of twenty minutes has been reached. Patient's susceptibility to be constantly borne in mind.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

Tinea versicolor, also known as chromophytosis, due to the vegetable parasite microsporon furfur, responds readily to surface radiations with the Alpine type of lamp.

The author has treated numerous cases of tinea versicolor, several of which were very widespread, even extending up beyond the collar line, which is unusual, as the microsporon furfur generally avoids the light and prefers the unexposed portions of the body.

While the disease is decidedly a chronic one, lasting untreated for years and usually confined to adults, its life is not a very long lived one when once exposed to the ultra violet rays, usually three to four treatments only being necessary.

With the exfoliation which takes place myriads of inactive microsporon furfur are thrown off.

In the cases of tinea versicolor treated the disease had its beginning as pin-head to pea-sized, yellowish macules which were usually scattered over the chest and in the scapular regions, coalescing with the formation of large patches or areas which were irregular in shape with elevated edges. The scales were furfuraceous or mealy, which were rendered more apparent by scraping; the color varying from pale yellow to dark brown, sometimes assuming a salmon tint. Itching was slight although in some cases increased due to perspiration. In none of the cases treated were the patches elevated above the surface of the skin.

TUBERCULOSIS CUTIS, LUPUS VULGARIS, TUBERCULOSIS VERRUCOSIS CUTIS, SCROFULODERMA.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of one foot has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of forty-five minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

In the treatment of tuberculosis of the skin the author has used both the Kromayer and the Alpine Lamps, preferring the Kromayer Lamp for small isolated areas of lupus vulgaris and tuberculosis cutis. Where the areas have been widespread the author as well as the patients have preferred the surface radiation method of treatment. The compression method of treatment, however, gives quicker results in the treatment of this condition.

Surely tuberculosis of the skin succumbs much more readily to ultra violet light treatment than to any other known method, the author believing it to be even superior to x-rays.

In the treatment of tuberculosis of the skin the author has made it a routine practice to ray the entire body, both front and back, at least once a week for the systemic effect to be obtained.

In the treatment of the cases of lupus vulgaris which have come under the author's observation the patients have varied in age from as early as six years on to middle life; some cases having been of very short duration and others having existed for years; the lesions beginning as brown-

ish or reddish papular patches, some being associated with ulcers and the characteristic scarring of lupus.

The papules or nodules were softer than the surrounding skin. Tubercles in some cases gradually developed from the papules which became aggregated and formed variously sized and shaped patches. The ulcerations, however, were rather shallow and irregular in outline.

The secretion was very scanty, although in some cases there was a tendency to bleed easily. In one case there was exuberant granulations (lupus hypertrophicus). In this case the granulations were first removed by electrodehydration (dessication) and then the ultra violet rays applied.

In the cases treated the sites of predilection were upon the nose, cheeks and ears. In one case the mucous membrane of the mouth was involved and the ultra violet rays were directed into the buccal cavity by means of the quartz rod, although the author believes that the results obtained were due more to the surface radiations which were given the entire body rather than to the rays from the quartz rod because of the inability to properly focus these rays.

Tuberculosis cutis verrucosa, of which the

author has had to treat two cases, responded to two penetration exposures of thirty minutes' duration with the Kromayer Lamp.

Three cases of scrofuloderma were treated by the author with prompt and satisfactory results. In two of these cases the scrofuloderma was secondary to underlying lymphatic glands, which had become infected with the tubercle bacillus. The glands in both cases slowly increased in size, underwent softening and consequent degeneration. The overlying skin, becoming attached thereto, was of a purplish hue and likewise broke down into ulcerations. Fistulous tracts were associated with it.

The ulcers were linear, undermined, with thin edges and uneven floors, and covered with sluggish granulations. In one case irregular corded bands were the result of scar formations.

These readily responded to treatments with the compression method by the use of the Kromayer Lamp.

ULCERS.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until

a minimum distance of eighteen inches has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of twenty to thirty minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

Chronic ulcers of various kinds respond quickly to surface radiation with the Alpine Lamp. The treatments are naturally mild because the object in view is to increase stimulation and at the same time sterilize the lesions. Healthy granulation takes place in a surprisingly short time, which is followed with regeneration of the epithelium.

X-ray ulcers as well as x-ray dermatitis respond exceedingly well to ultra violet radiations.

URTICARIA, LICHEN URTICATUS, ANGIONEUROTIC ŒDEMA.

LAMP: Alpine Sun Lamp.

DISTANCE: First treatment three feet, gradually decreasing six inches with each successive treatment until a minimum distance of eighteen inches has been reached.

TIME: First treatment five minutes, increasing five minutes with each successive treatment until a maximum of twenty minutes has been reached.

FREQUENCY OF REPETITION: Forty-eight hours for first three treatments and then twice weekly thereafter.

Chronic urticaria, which at times is the bane of the dermatologist, has responded admirably to ultra violet radiations by the surface method of treatment in the hands of the author. Six to eight treatments, as a rule, have been necessary. After the second and, at times, third radiation, the intense itching and pricking has ceased.

Radiations of the entire body, both front and back, were given in all cases treated, the patients thereby getting the systemic effects of the rays as well.

It was not necessary in any of the cases treated to resort to "burning." Exfoliation of the epidermis took place in two cases, which, however, is not a necessity.

During the interim between treatments inunctions with olive oil emulsion were advised (see author's "Elementary Dermatology").

The author has had to treat one case of

LICHEN URTICATUS,

that papular form of urticaria which closely resembles scabies, which was in a child eight years of age. This case had been of long duration and had refused to respond to any type of local application or internal medication. Six applications of the rays with the surface method of treatment brought about an absolute eradication of this troublesome condition.

ANGIONEUROTIC ŒDEMA,

otherwise known as Quinque's œdema, of which two cases have been treated by the author, responded rapidly, and a year and a year and a half after treatment no apparent return has manifested itself. In both of these patients there was a constant tendency to recurrence.

In this type of urticarial manifestation there was a sudden appearance of circumscribed swellings of the skin which were decidedly red. In one case the face was the particular site of election, and in the other the extremities. Swellings would come rather suddenly, even developing within a few minutes or an hour.

In one case the mucous membranes of the mouth as well were involved, so much so that respiration and deglutition were difficult.

Surface radiations of the entire body, both front and back, were practiced in these two cases, and there is no doubt that the systemic effect produced by the rays was responsible for the results obtained.

X-RAY DERMATITIS, X-RAY ULCERS, X-RAY KERATOSES.

Ultra violet radiation in the treatment of the untoward effects following x-ray exposure is of great benefit.

In the simple types of x-ray dermatitis, that is, the superficial burns, nothing will ameliorate them as quickly as very mild rayings with the Alpine type of lamp. The distance should at least be three feet, and the exposure not more than five minutes. The distance at no time should be increased. Three to four exposures at intervals of forty-eight hours should be sufficient.

For the treatment of x-ray ulcers see under ulcers, page 158.

X-ray keratoses, which it is now recognized are pre-epitheliomatous in nature, should be treated with the Kromayer Lamp in close approximation under firm pressure for at least

thirty to forty minutes, the keratoses having previously been removed.

One to two such deep penetrative treatments only are necessary; the time of interval being regulated by the amount of time necessary for complete reaction.

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